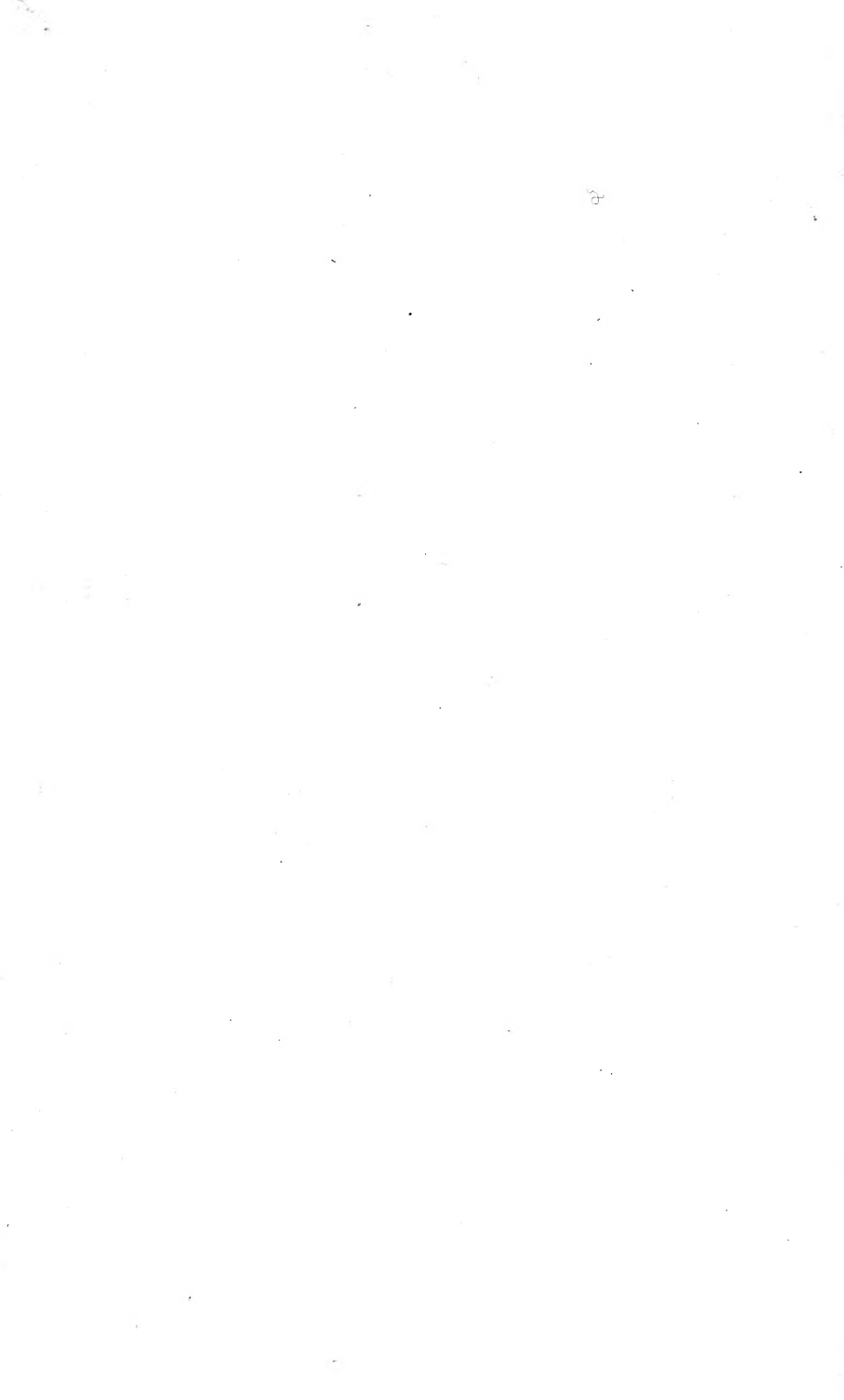
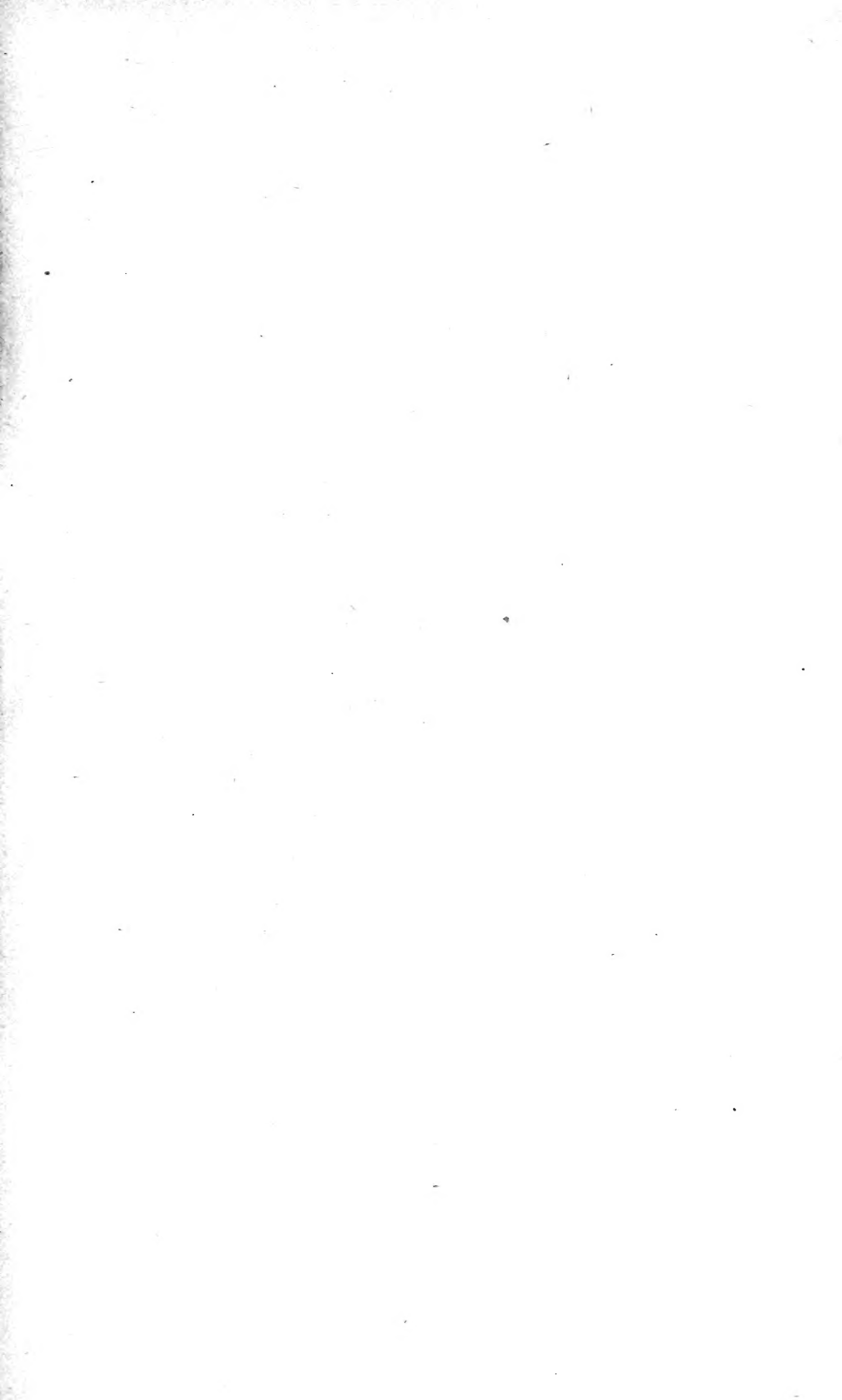


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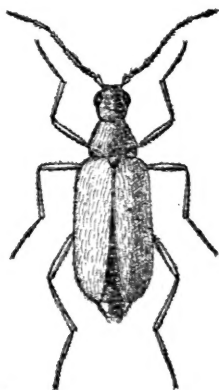
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HENRY SKINNER, M. D.  
PHILIP P. CALVERT, Ph.D., Associate Editor.

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# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

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Our frontispiece shows the beauties and possibilities of the three-color process for insects like butterflies and moths which have a plane surface. These brilliant butterflies have been photographed direct, and the three-color plates were made by the well-known house of illustrators and engravers, Gatchel & Manning of Philadelphia. The plates were made to test the possibilities of the colored inks made for this kind of work by the Charles Eneu Johnson Co. of Philadelphia. We are firmly convinced that the possibilities of photography for the illustration of insects is by no means fully realized, but it is necessary to have more than a commercial interest in it. The entomologist, the plate maker and an expert photographer should work together to achieve the best results, more especially when the smaller species are figured.

## Standards of the Number of Eggs Laid by Insects. II.

Being average obtained by actual count from the combined eggs of twenty (20) depositions or masses.

BY A. ARSENE GIRAULT.

Standards, of course, are absurd; there are none in such cases as this. The following are offered to serve as *general* averages of the number of eggs laid normally, and to fix a more or less definite range. Time is saved.

The idea of compiling these was suggested by the fact that the estimates and ratings of authors—founded on one or two counts, and too frequently being but estimates in the true sense of the word—differed so widely as to cause a little confusion.

A few examples given below will illustrate. Only two insects are included in this installment; more are to follow whenever the conditions are such as to make it practicable: (1.) eggs in definite masses; (2) eggs in sufficient quantities.

The first of this series was published in the ENTOMOLOGICAL NEWS, 1901, p. 305.

### 2.\* CLISIOCAMPA AMERICANA.

No.	Date—1903	No. counted, per mass	Successive totals	Av. per egg mass	Max. Min.	Range
1	Feb. 1	324	324	324		466
2	" 10	332	656	328		
3	" 10	313	969	323	313	
4	" 11	400	1369	342		
5	" 16	354	1723	345		
6	March 6	335	2058	343		
7	" 6	376	2434	347.7		
8	" 6	370	2804	350.5		
9	" 6	376	3180	353.3		
10	" 6	332	3512	351.2		
11	" 6	417	3929	357.1		
12	" 7	443	4372	364.3		
13	" 7	401	4773	367.1		
14	" 7	363	5136	366.8		
15	" 7	331	5467	371.1		
16	" 9	433	5900	368.7		
17	" 9	366	6266	368.6		
18	" 9	368	6634	368.5		
19	" 16	406	7040	370.5		
20	" 17	466	7506	375.3	466	313
20			7506	375.5	466 313	153 Finals

\* For the first of these series, see ENT. NEWS, *ubi supra*.

The lowest recorded count—not included here, being abnormal—was 99.

"The females lay their eggs, about *three* hundred in number, in a belt."—C. H. Fernald, Bull. Mass. Hatch. Exp. Sta., No. 12, p. 23.

". . . . about 250 eggs, . . ."—Bull. Neb. Exp. Sta., No. 14, June, 1890, pp. 25, 29, quatis.

"The eggs are deposited during that month upon the smaller twigs of our fruit trees in ring-like clusters, each composed of 15-20 rows, containing in all from *two* to *three* hundred."—Saunders. "Insects Inj. to Fruit," p. 48.

". . . . (about 300 in number) . . ."—Lugger. Bull. Minn. Agr. Exp. Sta., No. 61, Dec., '98, p. 192.

## 3. CHIONASPIS FURFURUS.

No.	Date—1903	No. counted, per mass	Successive totals	Av. per egg mass	Max.	Min.	Range	
1	Nov. 1902	79	79	79			84	
2	"	63	142	71				
3	"	83	225	75				
4	Nov.	42	267	66.7				
5	"	62	329	65.8	84			
6	"	84	413	68.8				
7	"	63	476	68				
8	Mch. 27 '3	61	537	67.1				
9	"	79	616	68.3				
10	"	70	686	68.6				
11	"	75	761	69.1				
12	28	82	843	70.2				
13	28	33	876	67.3		33		
14	31	59	935	66.7				
15	31	82	1017	67.8				
16	31	59	1076	67.3				
17	Apl. 1 '03	59	1135	66.7				
18	4	76	1211	67.2				
19	4	58	1269	66.7				
20	7	62	1331	66.5				
20			1331	66.5	84	33	51	Finals

The lowest count recorded is that given in foregoing; the highest, not mentioned in foregoing because suspected to be the combined eggs from two scales, is 122. The estimates on the number of eggs of this species are about correct.

Howard, from many counts, gives as the average number of eggs in healthy masses of a closely related species, *Mytilaspis pomorum*, from 65-75, and the range from 50-100.

## The Colossal Silk-worm Moths of the Genera *Attacus* and *Rothschildia*.

BY ALPHEUS S. PACKARD.

The word colossal is used advisedly in speaking of these moths, for they are mammoths compared with the most primitive Lepidoptera, such as *Erythrocephala* and *Micropteryx*, which are no larger than small-sized caddis-flies.

The species of *Attacus* comprise the largest in size and expanse of wings of all the Lepidoptera, although the bulk of the body is exceeded by some Sphingidæ. The lamented Mr. Grote had justly separated the American species, before that referred to *Attacus*, under the name *Rothschildia* from *A. atlas*. Our own studies both as to the larval and adult characters had also led us to regard the American *Attaci* as belonging to a distinct genus, and we had given a ms. name to the group. In their venation and the antennæ as well as other characters the species of *Rothschildia*, which among Lepidoptera are typically neogæan, not occurring in Africa or Asia, present constant differences from *Attacus*. There are also noticeable differences in the markings, *Attacus atlas* and its congeners presenting constant differences.

The presence of a lanceolate oval clear spot in the last subcostal cell shows that *Attacus* is more specialized than *Rothschildia*. The ocellus present near the apex of the forewings of *Rothschildia* is wanting in the species of *Attacus*, its place being taken by a deep indian red slash, ending in a fine line passing to the outer edge of the wing.

As regards the larval characters of the two genera in all their stages we now have very fair material. We are indebted to M. G. Poujade for excellent figures of the larva of *Attacus atlas*, (*Annales. Soc. Ent. France*, 1880, Pl. 8). I have, with the aid of Mr. L. H. Joutel, reared the larva of, and have colored drawings of *Rothschildia orizaba*, *R. jorulla (cinctus)*, and in the American Museum of Natural History is a series showing the three stages of *R. jacobea* from Buenos Aires. Burmeister has also given good colored drawings of the caterpillar of *R. hesperus*, *ethra*, *aurota*, *betis*, and *speculifer*.



In their early stages (1 and 2) the two genera are much alike, especially *R. orizaba* and *A. atlas*, but the freshly hatched larva of *Attacus* differs in having much longer tubercles. In the second stages the differences are still more pronounced. Now in the third stage, or with the second molt, as is well known, there is a great acceleration of characters, and the larva suddenly assumes the markings and armature of the last stages, with of course some important differences. From this time on the two genera, Asiatic and American, follow widely divergent paths. In the neogæic genus (*Rothschildia*) the tubercles tend to become reduced, becoming in the fully fed larva small and button-like, until in *R. betis* they have, judging from Burmeister's figure, become wholly atrophied.

In *Attacus*, however, after the second molt the tubercles become long and finger-shaped, while the spines have disappeared. This specialization is maintained through all the succeeding stages with the result that we have a very different larva from that of *Rothschildia*, the tubercles of the dorsum more especially being long, digitiform and somewhat pointed; it has also retained the long tubercle in front of each prothoracic spiracle, of which only the merest vestiges are present in *Rothschildia*.

The genus *Attacus* is evidently the end or terminal twig of a series of Attacine forms, as shown both in its larval and adult characters. The great size of the species is a feature of its specialization, just as the big mammals, such as the elephant, hippopotamus, and whales, are the result of extreme specialization due to their habits and surroundings.

Of the genus *Attacus* there are four species, inhabiting southeastern Asia, or the oriental region of arctogæa. Of these *A. atlas* appears to be probably the stem form, and occurs in Southern China (Macao and India). *A. crameri*, apparently the most extreme and recent form, inhabits Amboina, *A. cæsar* Mindanao, *A. atlas* var. *lorquinii* also the Philippines, and *A. imperator*, Bohot, one of the Philippine Islands; all these forms being local varieties resulting from local variation and isolation. The magnificent and very rare form, *Coscinocera*, Queensland (Tring Museum), Northern New Guinea, New

Ireland, which is a brown, tailed form, and seems to have diverged from *Attacus crameri*, or an earlier form, is an instance of the origin of a local genus, originating from some sport perhaps, becoming an island form of generic value.

The American genus *Rothschildia* is represented by fifteen species, most of which appear to be valid. They are confined to Central America and the forest regions of South America; none occurring on the Pacific coast of South America, in Chili, or in Patagonia. Two species (*R. jorulla (cinctus)*, *R. orizaba*) cross into Arizona, and *R. erycina (Attacus splendidus* Beauv.) occurs in Texas.

It is worthy of notice that species of neither of these two genera occur in Africa, where, however, four species of *Philosamia* are found, while *P. cynthia* and its offshoots or local forms inhabit the Oriental Realm. With little doubt, however, *Callosamia* and *Philosamia* are on the whole more primitive forms, and the latter genus may have given rise to *Attacus*.

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## Notes on the Pupation of *Vanessa Antiopa*.

BY W. L. W. FIELD, Milton, Mass.

I. INTRODUCTORY.—Unusual climatic conditions during the spring and early summer of 1903 delayed the maturing of the first brood of *Vanessa antiopa*, and the larvæ of the second brood were consequently very late in appearing. In some localities the pupæ of the second brood were not formed until the middle of October. This belated transformation gave opportunity for some interesting observations upon the response of the insects to conditions of light and temperature encountered upon the bare walls of a building in the short days of mid-autumn. The main school building of Milton Academy is built of red brick with white stone trimmings, and faces nearly south. There are tall white columns at the entrance, and all the window casings are painted white. A row of elm trees and a dark green fence separate the school grounds from the street at this point.

II. MOVEMENTS OF THE LARVÆ.—Larvæ of *antiopa* began to leave the elm trees about October 1st. For two or three

days they appeared only in small numbers; but, by the end of the first week, the migration had begun in earnest. The larvæ were to be seen crawling along the paths, but always toward the front of the building. Reaching the vertical wall, they would climb upward until turned from this direction by a projecting course of brick or a window ledge. Anything of this sort, having a horizontal under surface exposed, seemed inviting to the larvæ, and many secured themselves for pupation in such situations.

It soon appeared, however, that the front of the building was not equally favored by the larvæ at all times. In the early forenoon the eastern end attracted them, and in the afternoon the slanting rays of the sun led a few late wanderers around the corner to the western wall. Most of these wanderers, however, ultimately returned to the front of the building. The few which pupated on the end wall chose brightly lighted situations, either on white-painted woodwork or directly against the vertical surface of a brick.

On the front of the building, at noon of a clear day, the heat and light were intense, and the larvæ observed there at such times were seen to seek the deep shade of the water-conductors in the angles of the basement wall. At other times, when the conditions were not so extreme, they suspended themselves in the broad daylight. Finding available situations on both bricks and woodwork, each larva appeared to make its choice with reference to the temperature of the air near the wall and the amount of sunshine.

No larvæ or pupæ were found upon the north wall at any time during the whole period. This may be largely due, of course, to the fact that this was the aspect of the building most distant from the elm trees.

Two or three larvæ sought the green fence, and pupated in the partly-shaded angles of that structure. I did not see these until pupation had been accomplished.

III. COLORS OF THE PUPÆ.—The experiments reported by Wood (1867), Poulton (1890) and others, showing that the colors of certain pupæ are determined by the colors of neighboring objects, are well known. Poulton has further shown

that the period of susceptibility is brief, and immediately precedes the act of pupation.

The pupæ which I had under observation nearly all showed this phenomenon to a marked degree. The whole number of larvæ which pupated successfully on the building and fence was 71. Of these, 29 were on white surfaces, and all formed pupæ of a pale ashen color; 34 were on red surfaces, and 32 formed pupæ conspicuously marked with brick red; 8 were on dark surfaces, all formed black or dark gray pupæ.

The exceptional cases were two in the second group, which were black. It is possible that with these individuals the period of susceptibility was reached during the night.

Of four larvæ taken from the building and kept in the laboratory, three, which were placed in light-tight wooden boxes, gave black pupæ; and one, which was kept in a white paste-board box covered with glass, gave a pale ashen pupa.

The three groups of pupæ were kept under observation until the butterflies emerged, to see if any significant difference in the duration of the pupal state appeared; but none was discovered.

**CONCLUSION.**—The larvæ of *Vanessa antiopa*, when about to pupate, react to light, heat, gravity and contact, as summarized:

**LIGHT.**—The larvæ give clear evidence of their preference for ordinary daylight over deep shade on the one hand, or the glare of reflected sunlight on the other. The reaction to light is secondary to the heat-reaction until the larva has suspended itself, when the period of greatest susceptibility to light begins.

**HEAT.**—A certain optimum temperature, apparently not far from 60° F., encouraged pupation in the most diverse situations. A much lower temperature drove the larvæ to sheltered nooks with southern exposure; a much higher one sent them into shaded spots.

**GRAVITY AND CONTACT.**—The responses to gravity are complex and at first somewhat obscure. The larvæ crawl down the trunk of the tree and up the front of the building. Favorable conditions of heat and light being found, contact stimuli probably lead it to spin its cushion of silk. Response

to gravity is seen in the hanging position which the larva then assumes.

Valuable assistance in these observations was given by several of my pupils in Milton Academy.

#### REFERENCES.

- Wood, T. W., 1867. Proc. Ent. Soc. Lond., pp. 99-101.  
Poulton, E. B., 1890. The Colours of Animals.

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## Anopheles in California, with Description of a New Species.

BY ISABEL MCCRACKEN, Stanford University, Cal.

(With Plate II.)

In September, 1901, I began to look for individuals of the mosquito genus *Anopheles* in the vicinity of Stanford University. The University is situated near the base of the San Francisco peninsula, which is thirty-five miles long and about twenty-five miles broad at its base, and extends north and south between the Pacific Ocean and a long southern arm of the Bay of San Francisco. Running its full length about midway between ocean and bay is the Santa Cruz (or Sierra Morena) Range of mountains, the altitude of the crest being about 2,500 feet in the south, and only slowly decreasing in altitude toward the north. My collecting ground, in the vicinity of the villages of Menlo Park, Palo Alto, Mayfield and of the University, has been on the bay side of these mountains in the southern or basal portion of the peninsula.

The locality is not a malarial region. Several cases of malaria have been reported by resident physicians, but it appears, upon inquiry, that each patient so reported had either recently been away from the town or had recently come from a distance.

The various lakes, pools, streams and troughs in the neighborhood were visited continuously from September 5 to December 1, 1901, and again from March 1 to May 10, 1902, at intervals of a week or two.

*Anopheles punctipennis* and *Anopheles maculipennis* were found at various times and in various places, *A. maculipennis*

having the wider range and being more abundant in this limited area.

The following table gives the distribution, association and date of finding :

	Date	Species.	Locality	
1	Sept. 5 or	A. punc. L.	Francisquito Cr.	With Culex (species not identified).
2	" 7	" " L. & P	Flume	Abundance of Algæ.
3	" 12	" " "	Francisquito Cr.	Without Culex (opposite side of stream from 1.
4	" 19	" " & mac. L	" "	A mile or so below where 1 and 3 were found.
5	" 19	A. mac. L & P	Pasturage Trough	With Culex incidens.
6	" 29	" " "	" "	A mile or so west of trough where 5 were found.
7	" 29	" " L	Flood Lake	With Culex tarsalis.
8	Oct. 5	A. punc. & mac. L	Pasturage Trough	Same as 6.
9	" 5	A. mac. L	" "	A mile or so east of trough where 5 were found.
10	" 5	" " L & P	" "	In a field on opposite side of road from 9.
11	" 6	" " L, P & E	Tank overflow	With Culex tarsalis.
12	" 6	A. punc. L & P	Francisquito Cr.	100 yds. or so above where 4 were found, in foul water.
13	" 12	A. punc. L & P	Los Francos Cr.	About a mile above where it enters Francisquito, with Dixia.
14	Nov. 1	" " L, P & E	Francisquito Cr.	About a mile above where it is joined by Los Trancos, with Dixia.
15	" 5	A. mac. L & P	Tank overflow	With Culex tarsalis and Dixia.
16	" 8	" "	Felt Lake	With Dixia.
17	" 17	" "	" "	" and Culex tarsalis.
18	Mar. 14 or 2	" "	Tank overflow	Same as 11, with dragon-fly and beetle larvæ and tadpoles.
19	" 28	A. mac. L	Felt Lake	With dragon-fly larvæ
20	April 8	" " L & P	Roadside pool	Near where 9 were found last year—not so abundant—tadpoles.
21	" 8	" " L	Frenchman's Lake	
22	May 3	" " L & P	Felt Lake	

The collecting points were all within four miles north or south of the University, and within six and a half miles of each other. Felt Lake, the farthest point in one direction, is between 200 and 325 feet above sea level. It is a reservoir that lowers during the summer months below its outlet, but does not dry out entirely. Flood Lake, the farthest point in the opposite direction, is within a half-mile or so of tidewater and usually dries out during the summer months. *A. maculipennis* was found in both. The troughs visited contain water all the year round. The creeks frequently dry out during the summer months. The tank overflow has been permanent. Frenchman's Lake is a small reservoir that dries out.

At no time or place were the larvæ of either species very abundant. No adults were seen flying except on the evening of April 23, 1902, in the neighborhood of Francisquito Creek, in the willows and alders, when they were quite abundant.

The larvæ were, with one exception, found in comparatively clear water. On October 6, 1901, *A. punctipennis* was found in the creek, in very foul water.

On September 29th, 1901, a few full-sized larvæ and several pupæ were brought to the laboratory from Felt Lake. A few days later the adults issued, and proved to be an unidentified species.

This species was found continuously in small numbers at Felt Lake from October 5th to November 8th, 1901, invariably in company with *Dixa*, occasionally in company with *A. maculipennis*, and, on November 8th, with *Culex* eggs that later development proved to be those of a new species, *Culex kellogii* Th., recently described by Theobald (*Canadian Entomologist*, vol. xxxv, p. 211, August, '03).

In general appearance and habits, the larva of this new *Anopheles* is not unlike that of *maculipennis*, as described by Howard ("Mosquitoes," p. 103 *et seq.*), and in greater detail by Nuttall ("Studies in Relation to Malaria," *Jour. of Hygiene*, vol. 1, 1900, p. 51 *et seq.*)

In detail we find, in a fully-grown larva of this species, on the ventral surface of the thorax, three sets of lobes, bearing characteristic hairs: (*a*) a pair on the prothoracic part of the

thorax, bearing four stout, bristle-like, unbranched hairs, three of equal length and one half the length of these; (*b*) a pair on the meso-thoracic part of the thorax, bearing two stout, bristle-like, unbranched hairs, unequal in length; (*c*) a pair on the meta-thoracic part of the thorax, similar to, but shorter than those of *b*. These parts differ somewhat from corresponding parts in other species examined.

The pupa agrees in a general way with the pupa of *A. maculipennis* described by Dr. Nuttall, and with my own observations upon *A. punctipennis*. There is to be observed, however, a difference in the character of certain hairs on the posterior lateral margins of the abdominal segments. In the species under observation, these are stout and simple on each segment from the second to the eighth, becoming branched on the eighth, agreeing in this particular with *A. maculipennis*, but not with *A. punctipennis*.

There is also a characteristic difference in the marginal teeth on the posterior fins. In the new species these are short and sharp, and appear in three longitudinal rows, the teeth decreasing in size postero-anteriorly.

It is in the adults, male and female, that the most characteristic difference between species is found, noticeably in the markings of the palpi, the setæ on the genital lobes of males, scales, and the markings of wings on both males and females.

The following is a description of the adult of the new species:

**Anopheles Franciscanus** n. sp.

Male.—Head dark brown, with short, dark, erect scales toward the nape, emarginate and slightly forked, vertex and anterior part of occiput with short, light brown scales not forked, a tuft of light brown hairs projecting forward between the eyes, a row of similar hairs projecting forward, encircling the eyes posteriorly; eyes deep purplish brown; antennæ about two-thirds length of palpi, yellowish-brown hairs, basal joint dark brown; palpi equalling proboscis in length with emarginate scales from base to tip on under and outer surfaces, those upon outer surface dark, upon under surface light, long light hairs covering distal third, becoming short and stout at



the apex ; a light area at base of three distal segments, giving a slightly banded appearance ; two distal joints spatulate, proboscis scaled except labella, labella covered with medium stout setæ, a few light hairs at apex.

Thorax: prothorax lobes dark ; mesothorax dark brown at the sides, with scattered light hairs, a broad light brown patch in the middle ; within this light area a median line and obscure lateral lines ; scutellum light with single horizontal row of hairs ; metanotum dark without hairs ; halteres dark, covered with thick pubescence and emarginate scales ; stalks light without scales.

Abdomen, basal area of each segment light, covered sparingly with long, light hairs ; two stiff hairs on posterior margin of distal segment, stout hairs on margin of genital lobes.

Legs, coxa and trochanter light ; trochanters, femora, tibiæ and tarsi covered with short, dark, emarginate scales and setæ ; ungues of front legs very unequal, the larger one with a large median tooth and a smaller basal lobe ; middle ungues curved, with blunt basal lobes ; posterior ungues equal, simple ; posterior metatarsus slightly longer than tibia.

Wings with dark costa, with two distinct, nearly equal, yellow spots—one at distal end of sub-costal vein, one at and involving distal end of first long vein ; fringe dark, with a yellow spot at the end of each vein except at the end of the sixth ; the first spot carried on to the first long vein, the apical spot carried past over long vein on to the upper branch of the second long vein ; the second long vein dark except for a few basal light scales ; third long vein yellow in the middle, dark at the base and apex ; light area at base of third long vein carried over the fourth on to the upper branch of the fifth, with a few light scales at base ; main branch of fifth long vein light, except at base and apex ; distal half of sixth long vein dark, except at apex, basal half light ; sub-costal with a light spot carried to the the first long vein ; (in one specimen the light spot on sub-costal missing) ; third long vein prolonged slightly into the basal cell ; first sub-marginal cell longer and slightly narrower than second posterior cell, stem twice the length of the cell ; stem of second posterior cell prolonged to base of

wing; supernumerary cross vein adjacent to or but very shortly removed from mid cross-vein and equal to it in length when removed nearer to apex of wing; posterior cross-vein a little longer than mid cross-vein and varying in distance from it from one-half to almost twice its own length; third long vein prolonged slightly into the basal cell, darkest scales on costal, sub-costal and first long veins.

Palpi of the female equalling proboscis in length, light area at base of three distal segments, giving a banded appearance, clothed with scales, short hairs and setæ as in male, distal joints not spatulate; legs with the ungues equal; otherwise agreeing with the male.

This paper was prepared in the Entomological Laboratory of Stanford University, under the direction of Prof. V. L. Kellogg.

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### Pitcher-Plant Insects.

BY FRANK MORTON JONES, Wilmington, Del.

(Plates III, IV.)

In the rolling sandy country characteristic of the south-central portion of North Carolina, *Sarracenia flava*, the pitcher plant known locally as "fly-catcher" or "trumpets," grows to perfection. Great clumps of its greenish-yellow foliage fringe the ponds or occupy springy places on the slopes and in the hollows. Sometimes single leaves reach a height of more than three feet, but even in favorable situations the average height of the mature and well-developed leaves is not more than twenty-six inches. In August, most of the leaves are tough and mature, their secretion of nectar as a bait for insects seems to have ceased, and evidently the most active period for the capture of insects is over for the year; so that by gathering an armload of the larger leaves and carrying them to some drier, shadier spot for examination at leisure, we may get a very fair idea of the season's catch. The wide upper portion of the tube is usually empty, but on cutting down to where it narrows we soon come to the more recent victims, and some interesting moths in fairly good condition were secured in this way. *Agrotis ypsilon* was the largest living moth observed. Not infrequently two or three large beetles would be found,

tumbling over one another in fruitless efforts to climb the smooth walls, which sometimes bore evidence that a strong-jawed victim had vainly endeavored to eat his way out through the leaf.

Below the dead and dying captives of recent date are usually several inches of insect remains, the upper portion of the mass dry and showing little trace of the action of the liquid secretion of the plant. Only one butterfly, *Pyrameis cardui*, was recognized; but moths in great numbers and variety make up a large portion of the mass. *Catocala paleogama*, a small sphinx-moth and many Noctuidæ of smaller size were noted. Of other orders Coleoptera probably predominated, the upper portion of the mass containing many entire beetles and the lower portion being well studded with the horny legs and elytra of others more completely digested. Hymenoptera, Diptera and Orthoptera were all well represented, the latter order by a large green katydid and several specimens of *Dissosteira carolina*, with other smaller species.

Further down in the tube the remains become more and more fragmentary, the lower portion consisting of a gray, vile-smelling, semi-liquid mass of decaying material, with only here and there a trace of the hardest part of some insect; and here almost invariably are to be found one or more larvæ of the fly, *Sarcophaga sarraceniæ*, which Riley described in 1874 from specimens bred from *Sarracenia variolaris*.

If we walk through a clump of *S. flava* and bend up the hoods or covers as we pass, here and there we will find, sitting with folded wings in the pitchers, one, sometimes a pair of little moths. Attempting to frighten them out, they respond by backing further into the tube, which may be carried about almost indefinitely and handled very roughly before the little moth can be persuaded to leave its shelter. Once dislodged it flies quickly to another pitcher, alights outside near the rim, and runs in over the edge. A collection of these little moths from *S. flava* shows them to be of at least three species. The largest and most abundant of these, *Exyra ridingsii* (Plate IV), was described by Riley in 1874 from specimens captured in Alabama. It varies much in the proportion of black

and dull straw-yellow markings; of a series of twenty, the uppermost figure on Plate III shows the lightest, and directly below this the darkest specimen. Below these is shown the second and much less abundant species, *Exyra semicrocea* Gn., side by side with *Xanthoptera semiflava* Gn., with which it has been confused in some collections, the colors and pattern being almost identical; but *semicrocea* is readily distinguishable by its brownish-black head, collar and front of thorax, and by the direction of the line separating the yellow and black areas on the primaries. The third species, the lower pair illustrated on Plate III, has been identified for me by Dr. Dyar as *Exyra rolandiana* Grt. The smaller examples with blackish wings relieved by only a few red scales, approach *E. fax*; and the larger paler specimens exhibit varying proportions of yellow, purplish-red, and smoky-black.

To what extent the larvæ of these three species of *Exyra* have *S. flava* as their foodplant, the few hours spent among the plants was not sufficient to determine. The small pitcher-plant, *S. purpurea* (Plate III, middle figure) grew abundantly close at hand; some of its leaves showed evidence of feeding, and it is known to be the foodplant of *rolandiana*. All the larvæ observed in *flava* seemed to be of one species, and a small number of moths bred from this plant all proved to be *Exyra ridingsii*. The general appearance of the larva is shown on Plate III. When full grown it is brownish-maroon in color; head pale brown with darker band and spots; feet black; the larger tubercles spine-like, bearing fine hairs.

The young larva spins a fine silken net like a cobweb, closing the mouth of the pitcher. This web is often absent, sometimes ruptured and not repaired. Below this web the larva feeds on the inner surface of the leaf, moving about on a carpet of silk, and leaving the outer wall of the leaf intact. Soon its sawdust-like droppings effectually plug the small end of the pitcher, and this rapidly accumulating mass of cork-like fragments precludes the possibility of any danger to the caterpillar from the secretions or trap-like structure of the plant. Before spinning its cocoon the larva sometimes cuts a straight narrow groove around the pitcher, causing the upper

third to collapse and topple over, thus effectually closing the mouth of the tube. This habit was not noticed in time to ascertain how general it is, but the straightness of the groove and the evident care exercised to make this girdling operation complete, is not exaggerated in the drawing on Plate III. The cocoon is flimsily constructed, either in or just above the corky frass which fills the tube for several inches. The pupa is pale amber-brown, the colors and markings of the moth showing through before emergence. It is worthy of note that both Prof. Riley and Dr. Mellichamp describe the larva of *E. semicrocea* as closing the mouth of *S. variolaris* (Plate III, right hand figure) by fastening down the hood of the pitcher with silk, no trace of which habit was observed in *S. flava*.

Of *S. sarraceniae* and *E. semicrocea* in relation to *Sarracenia variolaris*, Riley says: "These two insects are the only species of any size that can invade the death-dealing trap with impunity, while the leaf is in full vigor." At least one other insect makes its home in *S. flava*, however; for of some hundreds of leaves cut open, four or five contained the nest of a solitary wasp. In each case the wasp had plugged the bottom of the tube, usually with fine dry grass,—in one instance with sphagnum moss; the three to five cells were divided by loosely packed masses of the same material, and the top closed with a tightly packed wad. The cells of one nest were packed with freshly gathered tree-cricket (*Ecanthus*), and in the one instance where the builder could be identified this proved to be *Isodontia philadelphicus* Lep. (Plate III, nest and wasp).

The above observations are the result of a few hours spent among the pitcher-plants of Richmond County, North Carolina, in the month of August. Anyone who has opportunity to observe them throughout the season, and especially in the early spring, would doubtless make many interesting discoveries in regard to these most curious plants and their insect visitors and victims. There is a problem for someone to work out in regard to the relation between the plants and certain ants whose colonies adjoin them, and there is a great deal more to be added to these necessarily fragmentary notes.

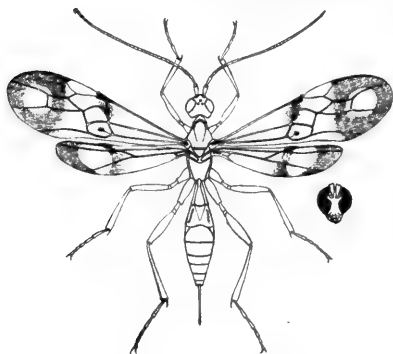
## Description of the type of the genus *Curriea* Ashm.

BY WILLIAM H. ASHMEAD, M. A., D. SC.

The genus *Curriea* was characterized in my generic table of the tribe *Braconini* in my Classification of the Ichneumon-Flies, in the Proceedings of the United States Museum, vol. xxiii, 1900, p. 137, upon a unique specimen collected by Mr. Rolla P. Currie, in 1897, in Liberia, Africa.

The genus is easily recognized by the very large eyes, which occupy the whole sides of the head, extend to the base of the mandibles, and are emarginate within opposite the insertion of the antennæ. It is the only genus, falling in the sub-family *Braconinae* with emarginated eyes. Below I give a figure and description of the type.

### *Curriea fasciatipennis* new species.



♀.—Length 7 mm.; expanse of wings 18 mm.; ovipositor longer than half the length of the abdomen. Uniformly brownish yellow, polished, impunctate, the eyes and the sheaths of the ovipositor, black; wings yellowish-hyaline, with three transverse fuscous bands, the first across from the parastigma, the second across from the extreme apex of the stigma, the third at the apical margin and connected with the second by

a fuscous streak along the front and hind margins of the wing; the hind wings have their apices fuscous: the costal vein, the parastigma, the post marginal vein except at apex, and the median vein, are fuscous, while the stigma and internal veins are yellow. The abdomen is shaped as in *Melanobracon*; the first segment has a deep furrow at each side, leaving a lanceolate elevation on the disk; the second segment has a triangular elevation at basal middle, with a depression on either side, the depressions with elevated lines; the third and the following segments are smooth, with the extreme apical margins rimmed, the third being separated from the second by a crenulate furrow.

Type.—Cat. No. 7320, U. S. N. M.

Mount Coffee, Liberia. Described from a single specimen taken by Mr. Rolla P. Currie, in honor of whom the genus was named.

## Destructive Beetles: A Note on Landscape Gardening.

BY A. L. MELANDER, Chicago.

(Plate V.)

The group of inland lakes feeding the Fox River in northern Illinois has lately sprung into popularity. Pistakee Bay is one of these pleasure resorts where the busy people of Chicago find a summer's recreation. During the times of its inhabitation by the Indians the region about this picturesque spot had become thickly studded with a forest of oaks and hickory extending far inward. The advent of the pioneer farmer in 1825 necessitated the clearance of the oak forest, but for practical, if not for aesthetic reasons a narrow fringe of timber was left outlining the rolling gravel banks along the shore. Twenty years ago sportsmen from Chicago discovered this retreat and advertised its popularity.

The wooded shore line, which had been regarded as useless farm land was surveyed and the lots found ready purchasers. One of the first who chanced upon this delightful place was especially assiduous in introducing "improvements," which consisted chiefly in keeping the grass cropped and free from fallen autumn leaves.

All went well until about five years ago. Then the twigs clipped by *Elaphidion villosum* became especially numerous. *Orthosoma*, *Clytus* and *Saperdas* flew nightly to the lighted windows. The shelf-fungus, *Polyporus*, started growing on some of the grander old oaks, and suddenly the fact was noticed that the prided trees were better in a wood-pile. The accompanying photograph clearly shows their condition at the time.

Why should not the dying trees have included the neighbors? A line of dead trunks practically marked the limits of the property under notice, while on either side the trees were still flourishing. The contour of the land will help to answer this question. The lots mentioned were selected on account of their wooded hills. On either side the land lies low, mucky from the drainage of the higher ground. This conformation manifests itself also in the character of the trees: in the lowlands the oaks are magnificent, higher the hickories appear. This difference in elevation, although less than twenty-five

feet, causes corresponding differences in vegetation striking enough to be classed almost as mesophytic and xerophytic.

Nature had long ago distributed her trees so that the leaves of the past year helped to grow those of the present, readjusting any unbalance caused by a deficit in the food-material of the soil. Mans' improvements, grass-cutting and leaf-raking, naturally impoverished the soil rendering the incipient xerophytic hill a poor producer. The trees were slowly starved, and in their weakened condition succumbed to the attacks of their insect foes. On the other hand the healthy trees of the lowland were able to withstand the depredations of fungi and boring insects, which probably would have had no incentive for attacking them.

A word of suggestion to similar land owners may be given. If these trees had been kept in health by artificial fertilization possibly they could have withstood the leaf-raking. To replace the abstracted nourishment trenches could have been dug around the trees to be filled with manure or other suitable food at the close of each season. Had this been done the trees would probably have been preserved more effectually than by waging war on the insect foes.

#### LIST OF THE PRINCIPAL BEETLES INFESTING THE TREES.

##### Bark-beetles and fungus feeders.

*Hister Lecontei* Mars.  
*Ips quadriguttatus* Fabr.  
*Tenebrioides mauritanica* Linn.  
*Pyrochroa flabellata* Fab.  
*Boletothragus bifurca*.

##### Wood-borers.

*Melanotus commuyis* Gyll.  
*Melanotus decumanus* Er.  
*Melanotus fissilis* Say.  
*Dicerca divaricata* Say.  
*Dicerca asperata* Lap & Gory.  
*Melanophila drummondi* Kirby.  
*Chrysobothris femorata* Fab.  
*Chrysobothris azurea* Lec.

*Lucanus dama* Thunb.  
*Orthosoma brunneum* Forst.  
*Elaphidion villosum* Fabr.  
*Elaphidion mucronatum* Fabr.  
*Eburia quadrigeminata* Say.  
*Xylotrechus colonus* Fabr.  
*Urographis fasciatus* Deg.  
*Alobates pennsylvanica* Deg.  
*Merinus laevis* Oliv.  
*Xylopinus saperdoides* Oliv.  
*Tenebrio tenebrioides* Beauv.  
*Diaporus hydni* Linn.  
*Meracantha contracta* Beauv.  
*Scotobates calcaratus* Fabr.  
*Platydemia subcostatum* Lab.

*Tenebrio* and *Alobates* outnumbered the others, and at the time of emergence could be found by dozens under the loosened bark. The presence of so many wood-borers attracted numbers of parasitic insects, especially ichneumons and Braconids. The wasp *Cerceris* was also noticed, possibly searching like its European relatives for the Buprestidæ.



## Two New Species of the Bee Genus *Perdita* from Indiana and New Jersey.

BY HENRY L. VIERECK.

### *Perdita gerhardi* n. sp.

My friend Mr. Wm. J. Gerhard recently sent me specimens (four ♀ and two ♂) of a little bee with the observation "They were taken on or hovering over *Monarda punctata*." Their color is much like the hue of the bracts and corolla of the flower they visit. My finding this little bee undescribed prompted me to determine a species I had taken in New Jersey on the same flower—this likewise proved to be an undescribed species.

I sent a specimen of *P. gerhardi* to Prof. Cockerell who kindly sent a table of allied forms.

*P. gerhardi* has characters of *Philoxanthus* Ashmead and *Perditella* Ckll. Length of female 5.5 mm.

*Color*—Bright yellow with brownish tinge; scape, head, dorsulum, pleura and legs with a ferruginous tinge; greater part of flagellum, spot mesad of each fovea, foveæ, spot on lower third of mesopleura, tarsi of posterior legs and posterior margin of femora of last pair of legs black or blackish. Margins (posterior) of first three dorsal segments of abdomen blackish. Wings pale yellowish, stigma pale yellow, nervures brownish.

*Head* very finely granulose. Clypeus and sides of face adjoining with sparse indistinct punctures. *Fovea on front* extending from a little below the supraorbital line, nearly to the level of the insertion of antennæ, close to the eye margins and shallow. *Face* distinctly quadrate. *Clypeus truncate*. *Labrum* nearly twice as wide as high, V on anterior margin. Clypeus semicircular at base. *Space between anterior and lateral ocelli* about one-half the distance between posterior ocelli; distance between posterior ocelli a little greater than that between them and nearest eye margin. *No malar space*. *Cheeks* narrow and rounded. *Scape* cylindrical as long as or a little longer than first four joints of flagellum; *pedicellum* broader than and longer or about equal to the first joint of the flagellum; *joints of flagellum* subequal. *Maxillary palpi* six jointed, joints subequal, *labial palpi* four jointed, first joint nearly twice the length of the other joints fused. Each side of face with a shallow pit near the insertion of antennæ.

*Thorax*.—Dorsulum dullish, finely granular, with sparse indistinct punctures and a median impressed line extending from the anterior margin to near the middle. *Tegulæ* more shining than dorsulum, rest of the thorax (except metathorax posteriorly which is more shining) sculptured nearly like dorsulum. *Posterior face of metathorax* with

a slight median line on the upper half and a narrow median line or rather impression on lower half. Metatarsus as long as the other joints fused. Claws cleft, the tooth distinctly shorter than the claw. Transverse median nervure received by the median cell about one-fourth mm. basad of the basal nervure; first and second recurrent nervures interstitial or nearly i. e. a little basad of interstitial with (but with no space whatever between) the transverse cubiti. Area of marginal cell about equal to second cubital; stigma at least four times as long as high and a little longer than the marginal cell, distance between stigma and insertion of first transverse cubitus in the marginal nervure about equal to the width of the truncation in the latter; second division of radius longer than the first, third longer than second, about as long as first plus second.

Abdomen.—Sculpture much like that of dorsulum; segments depressed along posterior margin, more in the middle than on the side. Pygidial plate flat, shining, triangular, narrowly but deeply emarginate at apex forming a w.

♂ Length 5 mm. Much like the other sex except in color. Frontal foveæ a dot. With exception of some blackish sutures, spot on mesopleuræ, spot on face mesad of fovea and dark tubercles, yellow. Wings as in the female, but the recurrent nervures instead of being inserted slightly basad of transverse cubiti are slightly beyond interstitial.

Type locality of *gerhardi* East Chicago, Indiana.

Prof. Cockerell's table of the Yellow species of *Perdita* is as follows:

	"About 4 mm. long, cheeks of ♂ armed with a stout spine. . . . .	1
	Larger, about 6 mm. or over, cheeks of ♂ not armed. . . . .	2
1	Head very large . . . . .	<b>larreæ</b> Ckll.
	Head not nearly so large . . . . .	<b>larreæ var. modesta</b> Ckll.
2	8 mm. long, mesothorax pubescent, pleura with a black patch	<b>beata</b> Ckll.
	Smaller about 6 mm. long . . . . .	3
3	Very pale yellow. . . . .	4
	Bright yellow . . . . .	5
4	Pleura with a black patch . . . . .	<b>wootonæ</b> Ckll.
	Pleura without a black patch . . . . .	<b>perpallida</b> Ckll.
5	Pleura with a black patch, mesothorax hairy; abdomen without <i>distinct</i> black bands . . . . .	<b>gerhardi</b> Vier.
	Pleura without a black patch . . . . .	6
6	Abdomen with four narrow black bands . . . . .	<b>howardi</b> Ckll. (flies in spring.)
	Abdomen without such bands . . . . .	<b>luteola</b> Ckll. (flies in fall.)"

*Perdita monardæ* n. sp.

Type locality, Riverton, New Jersey.

♀ Length 6 mm. The characters in italics in the preceding species occur in this one too.

*Head* as broad or a little broader than thorax, very finely granulose, dull; clypeus a little pointed medially on the anterior margin, at base. Distance between posterior ocelli distinctly less than that between them and nearest eye margin. Scape cylindrical, equal to or a little longer than first five joints of flagellum fused; face rather flat, no shallow pits. Rest of the insect sculptured like head, metathorax and abdomen inclining to shiny. Posterior face of metathorax at base with a shallow pit. Claws simple. Area of marginal cell greater than the area of the second cubital. Distance between stigma and insertion of first transverse cubitus on the radial nervure greater than the width of the truncation, second division of the radius shorter than the first, third division nearly equal to the first plus the second.

*Color*.—Dark metallic green, face with white and bronzy black marks, the bronzy black marks on the clypeus and supraclypeal mark; scape and flagellum yellow below, blackish above. A short line at base of posterior orbits, spot at base of mandibles, line from corner of pronotum to tubercles, tubercles, tegulæ and a spot on lower half of mesopleura whitish. Labrum and mandibles yellowish to ferruginous. Legs yellow except femora, four anterior tibiæ on posterior surface and posterior pair of tibiæ and legs which are dark brown to black. Abdomen colored like the legs *i. e.* yellow and black or dark brown, venter yellowish marked with brown.

♂ Length 4 mm. Claws cleft, otherwise like the other sex in structure and sculpture. Color pattern like that of the female, less black on the face, no broad suture of black between the dog ear marks and adjoining parts; supraclypeal mark and upper edge of lateral face marks yellow, below all is whitish, two small black spots on clypeus, tip of mandible brownish; about one-half of the cheek yellow. Scape in front and flagellum beneath yellow, scape on posterior surface and flagellum above dark brown to black. An interrupted band on pronotum, tubercles, greater part of propleura, large mark on mesopleura, tegulæ, base of wings, greater part of metapleura and legs (excepting stripe on femora and tibiæ, and tarsi of posterior pair of legs which are dark brown) bright yellow. Pale color pattern corresponds to that in the female, apex of fifth segment, all of sixth and entire venter brownish yellow. Apex of abdomen an acute angle, brownish testaceous. Wings pale, nervures pale brown, stigma nearly as pale as the membrane of the wing. Recurrent nervures interstitial.

Judging from the series of both species (*gerhardi* 4 ♀ ♀ 2 ♂ ♂, *monardæ* 7 ♀ ♀ 28 ♂ ♂) one is led to believe them very constant in every way. *Monardæ* has the dog ear marks absent more often than present, the pleural marks vary in size

but do not disappear; the abdominal marks are contiguous with the base of the segments, thus leaving a dark space between themselves and the apical margin.

*Monardæ* differs from *Cockerellia* Ashmead in having all claws of the male cleft. Both species are thinly pubescent with whitish hair. *Monardæ* was captured August 11, 1901, by the writer, the species being abundant at the flowers of *Monarda punctata*. *Gerhardi* was taken August 28, 1903. *Perdita octomaculata*, Say, was taken on *Aster*, Big Timber Creek, New Jersey, September 22, 1901, and on *Solidago*, Lawndale, Pennsylvania, September 15, 1901, by the writer,

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## Southwestern Geographical Names.

BY T. D. A. COCKERELL

I have lately received two very excellent papers—one by Mr. O. A. Johannsen, on Aquatic Nematoceros Diptera, and the other, by Mr. A. L. Melander, on Mutillidæ—both containing erroneous interpretations of Spanish-American geographical names. I would not offer any criticism at this time, were it not that the errors are by no means new, the literature of American entomology being scattered with them, so it becomes necessary to present some sort of a protest.

(1) Arroyo. This is the name universally used in the southwest for a dry watercourse; that is, one which is occupied by water only after heavy storms. Professor Townsend collected a large number of insects in an arroyo near La Luz and Tularosa, New Mexico; and the records of these are getting into the literature. In a paper of mine in the *Annals and Magazine of Natural History*, the word arroyo is followed by a comma, which was not in my MS., the printer evidently thinking it the name of a town. But in Mr. Melander's Mutillidæ paper I am horrified to see numerous species reported from a place designated "Arroyo, New Mexico"! This paper has several other names of localities spelled wrongly; but this is the characteristically persistent error.

(2) Baja California. "Baja, a place in California," has

long been celebrated in our literature. One might as well write of "New, a place in England." Baja California is Lower California, and is in Mexico. Because of this misunderstanding, Mr. Johannsen introduces *Simulium cinerium* erroneously as a species of the United States. Both this and *S. tamaulipense* (alleged to be from Texas) are exclusively Mexican so far as records exist.

Both Messrs. Melander and Johannsen write C. H. Townsend for C. H. T. Townsend. The error is a serious one, as C. H. Townsend is also a distinguished naturalist, and an entirely different person.

## Sending Insects Through the Mails.

BY L. O. HOWARD.

While there has been a very general exchange of cabinet specimens of insects by means of the United States mails, and while people have sent to the State Entomologists and to the government Entomologists living specimens with supplies of food, Section 494 of the Postal Laws and Regulations (page 226) specifically excludes insects from the mails. The enforcement of this regulation by a southern postmaster recently caused Mr. Wilmon Newell, State Entomologist of Georgia, to urge me to inform him accurately as to the attitude of the Post Office Department on this subject. I therefore prepared for the signature of the Honorable Secretary of Agriculture, a letter addressed to the Postmaster General asking for a modification of this section on the ground that its enforcement would hamper the work of the Department of Agriculture, and would cause serious inconvenience to entomologists all through the country. The Postmaster General replied promptly and wisely, and courteously agreed to the suggestion of Secretary Wilson, and urged that a representative of the Department of Agriculture be appointed to discuss any proposed amendment with the Superintendent of the Railway Mail Service. I was designated to act for the Secretary of Agriculture, and after consultation with Mr. Alexander Grant, Assistant General Superintendent of the Railway Mail Ser-

vice, the following order was prepared and was issued by the Postmaster General.

*“Office of the Postmaster General,  
Washington D. C., Dec. 16, 1903.*

Order No. 1269a.

Modify the Postal Laws and Regulations, edition of 1902, as follows :

Section 494, paragraph 1, line 3 ; omit the word “insects.”

Section 496 : Omit paragraph 7 and insert in lieu thereof the following :

7. Queen bees and their attendant bees, the “Australian lady bird,” insects (live or dried), and dried reptiles may be sent in the mails when so put up as to render it practically impossible that the package shall be broken in transit, the persons of those handling the mails injured, or the mail bags or their contents soiled. (See paragraph 1 of this Section.)

H. C. PAYNE, Postmaster General.”

Knowing that this order will be of wide interest to entomologists, I trust that this communication will be published in ENTOMOLOGICAL NEWS.

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## List of the Cicindelidae of North Carolina, with Notes on the Species.

BY FRANKLIN SHERMAN, JR., Entomologist N. C. Dept.  
Agriculture, Raleigh.

In the Canadian Entomologist for August, 1902 (vol. xxxiv, p. 217), Mr. Edward D. Harris has a paper entitled “Notes on Cicindelidae in North Carolina,” in which he mentions six species and varieties ; and this has stood alone, so far as I am able to learn, as a contribution to our knowledge of this family in North Carolina. The present paper is intended to be complete so far as it has been in the power of the writer to make it so, and is based largely on collections made in various parts of the State in the last two years. All actual captures of unquestionable authenticity of which I can find positive record, are

included, but no place has been given to doubtful or "probable" species. We have specimens of most of the species and varieties enumerated, as mentioned in the text.

The determinations have been made by Mr. E. A. Schwarz of the National Museum and Mr. Charles W. Leng of New York City, to both of whom thanks are due. The nomenclature adopted is that of Mr. Leng in his "Revision of the Cicindelidæ of North America."

In this list "Hen. No. —" refers to the numbers given to the corresponding species in Mr. Samuel Henshaw's "List of the Coleoptera of North America." The *letters* in parenthesis (E, NE, etc.), immediately after the name of a locality, denote its general position in the State, as east, northeast, etc.

1. ***Tetracha carolina*** Linn. Hen. No. 12.

Only records are from east central part of the State. Specimens in N. C. Dept. Agr. Collection.

*Raleigh* (E. C.) July 1900, C. S. Brimley. July 26, 1901, F. Sherman. July-Aug., 1902, frequent on pavements under electric lights; F. Sherman. July-Aug., 1902, common under stones in garden; C. S. Brimley.

*Princeton* (E. C.) July 28, 1902, F. Sherman.

2. ***Tetracha virginica*** Linn. Hen. No. 13.

Only records are from east central part of State. Specimens in N. Car. Dept. Agr. Collection.

*Raleigh* (E. C.). July 8, 1902, under board in sod orchard; F. Sherman. July 8-Aug. 16, 1902, eleven specimens under stones in garden; C. S. Brimley.

*Smithfield* (E. C.) July 30, 1902, under board near river bank; F. Sherman.

3. ***Cicindela unipunctata*** Fab. Hen. No. 17.

Only records are from western part of State. One specimen from collection of Morrison in N. C. Dept. Agr. Collection; others in U. S. Nat. Mus. Collection.

*Retreat* (W.), June 8 (yr.?), Hubbard and Schwarz.

*Mountain roads* (W.), Morrison, Blanchard.

4. **Cicindela scutellaris** var **unicolor** Dej. Hen. No. 19a.

Only records are from southeastern part of State. Specimens in N. C. Dept. Agr. Collection.

*Southern Pines* (S. E.), Mch, 1901; common on sandy soil near pine woods; F. Sherman.

*Montague* (S.E.), early May, 1902, E. D. Harris.

*Wilmington* (S.E.), Wenzel.

4a. Var. **modesta** Dej. Hen. No. 19c.

Only record is from eastern part of State.

*Goldsboro* (E.), early May, 1902, in road; E. D. Harris.

4b. Var. **rugifrons** Dej. Hen. No. 19d.

Only record is from east central part of State. Specimens in N. C. Dept. Agr. Collection.

*Raleigh* (E. C.) Sept. 11, 1902, C. S. Brimley.

5. **Cicindela sexguttata** Fab. Hen. No. 24.

All records from central and eastern parts of State. Specimens in N. C. Dept. Collection.

*High Point* (C.), early May, 1902, E. D. Harris.

*Jamestown* (C.), early May, 1902; along paths in woods near river; E. D. Harris.

*Chapel Hill* (C.) Apr. 4, 1888, G. F. Atkinson.

*Maxton* (S.E.) May 5, 1901; common on banks of ditch in pine woods; F. Sherman.

*Garysburg* (N.E.), Apr. 7, 1902; under loose bark of fallen tree; F. Sherman.

*Goldsboro* (E.) early May, 1902, in woods; E. D. Harris.

5a. var. **harrissii** Leng. Hen. not listed.

Only record is from western part of State.

*Mountain Roads*. (W) Beutenmüller.

6. **Cicindela patruela** Dej.—Hen. No. 24 b.

Only records are from western part of state. Specimens in N. C. Dept. Agr. Collection.

*Blowing Rock*, (W.) June 27, 1901. Not rare along paths at 4,000 ft. elevation. F. Sherman.

*Spruce pine*, (W.) Sept. 24, 1902, about 2,000 ft. elevation. F. Sherman.

"*Mountain roads*" (W.) Beutenmüller. Morrison.



**7. *Cicindela purpurea* Oliv.—Hen. No. 25.**

Only record is from high mountain elevation in western part of state. Specimens in N. C. Dept. Agr. Collection.

*Blowing Rock*, (W.) Aug. 15, 1902. Common along path through pasture at 4,000 ft. elevation. F. Sherman.

**8. *Cicindela splendida* Hentz.—Hen. No. 25, i.**

Only definite record from mountains in western part of state. Specimens in N. C. Dept. Agr. Collection.

*Homestead*, (W.) Sept 11, 1902. Roadside, very active and shy. F. Sherman. "N. C." Morrison.

**9. *Cicindela vulgaris* Say.—Hen. No. 32.**

Evidently throughout the state. Specimens in N. C. Dept. Agr. Collection.

*Raleigh*, (E. C.) Sept. 26, 1900, Oct. 1900, May 17, 1901, Mar. 29, 1902, Apr. 7. F. Sherman.

*Montague*, (S. E.) Early May, 1902 (specimens of typical size.) E. D. Harris.

*Goldsboro*, (E.) Early May, 1902 (Dwarf form.) E. D. Harris.

*Hamlet*, (S. E.) Early May, 1902 (Typical.) E. D. Harris.

*Southern Pines*, (S. E.) Oct. 15, 1900, Mch. 1901. F. Sherman.

*Jamestown*, (C.) Early May, 1902, (Typical) on banks of Deep River. E. D. Harris.

*High Point*, (C.) Early May, 1902 (Dwarf.) E. D. Harris.

*Charlotte*, (C.) Early May, 1902, abundant (dwarf) along creek. E. D. Harris. Apr. 25, 1902. F. Sherman.

*Burnsville*, (W.) Oct. 3, 1902. F. Sherman.

*Blowing Rock*, (W.) Aug. 29, 1902. F. Sherman.

**10. *Cicindela repanda* Dej.—Hen. No. 33.**

Abundant near water. Probably throughout the state, though all records but one are from central and western parts of state. Specimens in N. C. Dept. Agr. Collection.

*Hamlet*, (S. E.) Early May, 1902. E. D. Harris.

*Raleigh*, (E. C.) Oct. 1900. Abundant on sand near stream. F. Sherman. July, 1902, common. F. Sherman, Oct. 26,

1902. Numbers found under about  $\frac{1}{2}$  in. of sand on bank of stream, perhaps hibernating. F. Sherman.

*Jamestown*, (C.) Early May, 1902, abundant on banks of Deep River. E. D. Harris.

*High Point*, (C.) Early May, 1902. E. D. Harris.

*Charlotte*, (C.) Early May, 1902, on banks of stream—"in unusual range of size." E. D. Harris.

*Old Fort*, (W.) Sept. 9, 1902, common near stream. F. Sherman.

*Whittier*, (W.) Sept. 1902, common near stream. F. Sherman.

*Linville*, (W.) Aug. 1902, common near stream at about 3,000 ft. elevation. F. Sherman.

**11. *Cicindela 12-guttata* Dej.—Hen. No. 33 c.**

Probably throughout the state, though all records are from Raleigh to westward. Specimens in N. C. Dept. Agr. Collection.

*Raleigh*, (E.C.) Sept 1900, Oct. 1, 1900, Apr. 5, 1901. F. Sherman. Oct. 26, 1902, found under about  $\frac{1}{2}$  in. of sand on bank of small stream, perhaps hibernating. F. Sherman.

*Snow Camp*, (C.) Aug. 22, 1902. F. Sherman.

*Oakdale*, (C.) Aug. 22, 1902. F. Sherman.

*Jamestown*, (C.) Early May, 1902. Banks of Deep River. E. D. Harris.

*Charlotte*, (C.) Early May, 1902. Banks of stream. E. D. Harris.

*Homestead*, (W.) Sept. 11, 1902. In road near stream. F. Sherman.

**12. *Cicindela hirticollis* Say.—Hen. No. 35.**

Only record is from seashore. Specimens in N. C. Dept. Agr. Collection.

*Beaufort*, (*Shakleford Banks*) (*Extreme E.*) Aug. 9, 1902. Along inlet shores in company with *C. dorsalis* var. *media* and *C. marginata*. F. Sherman.

**13. *Cicindela punctulata* Fab.—Hen. No. 40.**

Common apparently throughout the state along paths. Specimens in N. C. Dept. Agr. Collection.

*Beaufort*, (Extreme E.) Aug. 11, 1902, common. F. Sherman.

*Raleigh*, (E. C.) July 15, 1902. F. Sherman.

*Chapel Hill*, (C.) Sept. 17, 1885. G. F. Atkinson.

*Oakdale*, (C.) Aug. 1902. F. Sherman.

*Greensboro*, (C.) Aug. 25, 1902, common. F. Sherman.

*Newton*, (C.) Aug. 1902. F. Sherman.

*Burnsville*, (W.) Sept. 1902, Oct. 1. 1902. F. Sherman.

*Blowing Rock*, (W.) Aug. 1902, common along path. F. Sherman.

*Waynesville*, (W.) July 1901, common along path. F. Sherman.

*Retreat*, (W.) May 15. Hubbard and Schwarz.

**14. *Cicindela dorsalis* var. *media*** Lec.—Hen. No. 42 a.

Only record is from seashore. Specimens in N. C. Dept. Agr. Collections.

*Beaufort*, (*Shakleford Banks*) (Extreme E.) Aug. 9, 1902, common on inlet shores in company with *C. marginata* and *C. hirticollis*. F. Sherman.

**15. *Cicindela marginata*** Fab.—Hen. No. 44.

Only record is from seashore. Specimens in N. C. Dept. Agr. Collection.

*Beaufort*, (*Shakleford Banks*) (Extreme E.) Aug. 9, 1902, on inlet shores in company with *C. dorsalis* var. *media* and *C. hirticollis*. F. Sherman.

**16. *Cicindela blanda*** Dej.—Hen. No. 49.

There is but one indefinite record for this species. "*N. C. River banks*." Leconte record.

**17. *Cicindela gratiosa*** Guer.—Hen. No. 54.

Only record for this species is from Wilmington, seven miles from seashore. Specimens were probably taken on shore. Specimens in N. C. Dept. Agr. Collection.

*Wilmington*, (S. E.) Wenzel.

**18. *Cicindela rufiventris*** Dej.—Hen. No. 64.

All records are from middle part of state. Specimens in N. C. Dept. Agr. Collection.

*Raleigh*, (E. C.) July 15, 1902. Along road in open mixed woods. F. Sherman.

*Durham*, (C.) Aug. 1902. In field near mixed woods. F. Sherman.

*Oakdale*, (C.) Aug. 22, 1902. F. Sherman.

*Greensboro*, (C.) Aug. 1902. F. Sherman.

**19. *Cicindela abdominalis* Fab.—Hen. No. 67.**

Only records from southeastern part of state. Specimens in N. C. Dept. Agr. Collection.

*Southern Pines*, (S. E.) Aug. 15, 1902. At edge of pine woods. F. Sherman.

*Wilmington*, (S. E.) Wenzel.

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## Two New Bees.

BY T. D. A. COCKERELL.

***Anthophora stanfordiana* n. sp.—♀.** Length about 15 mm.; black, with erect black hair, except that the mesothorax as far back as the hind edge of the tegulæ, and the dorsum of the second abdominal segment except basally, are thickly covered with ochraceous hair, and there is a little pale hair in other places, namely on the face, labrum, hind margin of third dorsal abdominal segment, and especially on the fourth and fifth ventral segments of the abdomen, where the light hairs are both numerous and long. The femora are dark red, but the tibiæ are reddish-black, while the tarsi are dark with the small joints reddish; the hair on the legs is black, but the middle tibiæ are tipped with pale, and there is at the apex of the basal joints of the hind tarsi a very conspicuous golden brush; the spurs of the middle legs are dark with strongly curved red tips. Tegulæ black and shining, with close minute punctures; wings fuliginous, basal nervure meeting transverse-medial.

♂. Length about 15 mm.; black, the clypeus, supra-clypeal stripe, labrum, spot on mandibles, lateral face-marks and front of scape, light yellow; the upper edge of the lateral face-marks is deeply concave, the orbital side ending in a sharp point at the lower level of the antennæ sockets; flagellum entirely black; hair at face, front and cheeks long and white, of occiput black; hair of thorax long and creamy-white, except on hind part of mesothorax, scutellum, and between the wings and the middle and hind coxæ, where it is black; mesothorax and scutellum with smooth and shining areas; wings considerably lighter than in the female; legs with mixed black and light hair, long and white on outside of tibiæ

and tarsi, purpureo-fuscous on inner side of basal joint of anterior tarsi, bright orange-ferruginous in the same position on the middle and hind tarsi; middle legs simple; basal joint of hind tarsi flattened and contorted, with a large tooth on the anterior margin; abdomen with erect hair, entirely yellowish-white on the first two segments, sparser and black on the others, with some long white hairs at the sides; apical segment strongly convex, bidentate, tomentose basally, with a slight longitudinal keel; venter with a band of light hair.

*Hab.*—One of each sex, collected May 17, 1892, by W. G. Johnson on the campus of Stanford University, California. The species is allied to *A. bomboides*, and would even better merit the name than that insect. It is one of the finest and most interesting bees in our fauna, and it seems remarkable that it has so long remained undescribed. Prof. V. L. Kellogg, to whom I am indebted for the specimens, kindly gives me the following information; "I have, among other specimens, perhaps two dozen taken from a single colony, the individual nests of which were all put in close together. This colony was situated in the side of a deep bank in somewhat sandy but nevertheless very hard and compact soil. Each entrance was capped by a long tube, two or three inches in length, made of bits of soil stuck together, and bent down so as to make the entrance obscure when looked at from above; also so as to protect the opening from falling water. The nest-tubes were about one-half inch in diameter." (Litt., Nov. 20, 1903.)

***Megachile latimanus grindeliarum* subsp. n.**

♀. Length 14 millim.; the light pubescence yellowish throughout; vertex and disc of mesothorax with much black hair (as in *mendica*), but scutellum with yellowish hair; abdominal bands weaker and narrower (with shorter hair), yellowish-tinged, with the overlapping pale orange hairs on the last two bands conspicuous; the erect black hair does not overlap the bands, nor does it project laterally (as it does in *monardarum*) so as to be conspicuous at the sides when the abdomen is viewed from above; ventral scape orange throughout; second recurrent nervure ending very near to the second (morphologically third) transverse-cubital; hair on inner side of basal joint of all the tarsi bright orange; apical dorsal segment of abdomen with erect yellowish bristles; abdomen perceptibly narrower than in *latimanus*.

*Hab.*—Colorado Springs Colorado, Sept. 10, (Cockerell). One at flowers of *Grindelia squarrosa*. Another, with denuded mesothorax, from the same locality.

The discovery of the male will probably show whether *grindeliarum* is really a race of *latimanus*, or a valid species. It seems just possible though not at all probable that it is the female of *M. avara*, of which the male only is known. It will be known from *M. nevadensis* by the ventral scopa being without black at the tip; the dorsal apical segment in *nevadensis* is said to be pale sericeous, that is, resembling that of *M. mendica*, and not that of the restricted group of *latimanus*, Robertson's genus *Xanthosarus*. The very much denser punctuation of the mesothorax, as well as the absence of projective black hairs at the sides of the abdomen, readily distinguish *grindeliarum* from *monardarum*. The description of *M. vidua*, Smith, so nearly accords with *grindeliarum* that I at first thought it possible that it might be applicable; but our insect is so unlike *M. maritima* (the European representative of *vidua*) that I do not think it can be *vidua*.

### A New Beetle from New Jersey.

BY WM. T. DAVIS.

(See Plate VI.)

Lakehurst, New Jersey, once called Manchester, has been to some of the New York City entomologists what Anglesea is to those from Philadelphia, or what "Butterfly Station" was to the insect collectors of Albany in the days of Mr. Bailey and Dr. Lintner. This is synonymous with saying that many interesting insects have been collected at Lakehurst, and it gives me pleasure to add to the number a Longicorn beetle pronounced by both Mr. Leng and Mr. Schæffer to be a new species. It is true that but one specimen has been taken, but its characters are such that it has been considered worth while to bring it to notice. It was collected last July while beating into an umbrella, and was pointed out as a valuable acquisition by Mr. Louis H. Joutel, for whom I am pleased to name it.

#### *Neoclytus jouteli* n. sp.

Black, head, thorax and elytra, except apical third, finely rugose. Antennæ dark brown clothed with light hairs; second joint short, as usual; outer joints slightly thickened. Head black, not carinated, eyes entire, oblique; front clothed with lighter hairs. Thorax black, clothed beneath

with lighter hairs; longer than broad, sides slightly arcuate, little wider than the elytra, and with fine strongly elevated transverse rugæ at middle and others on each side. Elytra, black with two oblique bands of white hairs, the anterior band narrow and the most definite. Beyond the posterior band much smoother; shining; slightly tuberculate and with minute pubescence. Abdomen black beneath; the meta-sternum dark brown with two transverse stripes of white pubescence. Legs dark brown, the femora black, or nearly so.

The length of the type is 6 mm., but the size will no doubt vary considerably as in other species of the genus. The insect is about the size and general aspect of a black *Euderces picipes*, but the structural characters are entirely different, and the resemblance does not extend beyond the first glance.

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WALDOBORO, MAINE, December 4, 1903.

ENTOMOLOGICAL NEWS.—Enclosed please find \$1 in renewal of my subscription for the ensuing year. I am much pleased by the position taken by the NEWS on the question of species and genera. If it were not for such protests there would be great danger that our system of classification would be reduced to a meaningless mass of names. The wholesale formation of monotypic genera and the description of species based on trivial characters should be stopped. Authors should, moreover, be compelled to deposit their types in some large museum, where they would be accessible to all students, before their descriptions are published. There is no influence to-day in American entomology so strong as that of the NEWS.—JOHN H. LOVELL.

# ENTOMOLOGICAL NEWS.

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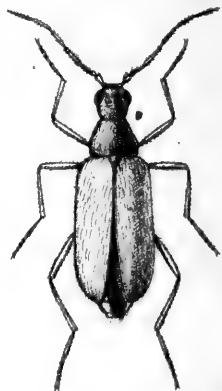
**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—Ed.

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PHILADELPHIA, PA., JANUARY, 1904.

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Prof. T. D. A. Cockerell has made a suggestion which we considered well worthy of being adopted by the NEWS. Instead of placing on the cover of the NEWS what he was pleased to term a monstrosity, he proposed a figure of the most interesting insect described during the previous year, and said that in his opinion *Ignotus ænigmaticus*, Slosson,\* was pre-eminently the one to use for this year, and we coincided in this opinion. This curious beetle was described by Mrs. Slosson in the Canadian Entomologist, vol. 35, page 183, and the account of its discovery is interesting reading. That most eminent savant, Mr. E. A. Schwarz, had the figure made for the NEWS. We have always found him more than willing to do anything to unselfishly advance the interests of entomology. In the future we propose to adopt the same plan of using a figure of the most interesting insect described during the previous year, for the cover of the January NEWS, and will be glad to receive any and all suggestions as to which species shall be selected. The selection will be made by the Editors in conjunction with the Advisory Committee.



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\* Described as being the size of a tiny brown ant.



## Entomological Literature.

**THE MOTH BOOK.** A Popular Guide to a Knowledge of the Moths of North America. By W. J. Holland. With Forty-eight plates. Doubleday, Page & Co. New York. Price \$4.00 net. Postage 34 cents extra.

There are 1500 figures in the colored plates and 300 text cuts. This work is uniform in size and typography with the well known Butterfly Book by the same author. Probably no book on any branch of American entomology has been anticipated with such keen interest as this one. The literature of the subject is greatly scattered through many publications and papers, and figures of our moths are by no means numerous. There existed no one book which the beginner could consult, and this work will be invaluable and will undoubtedly stimulate a much greater interest in these most interesting insects. The author has figured many species in a beautiful manner, as the three color process gives mechanical accuracy in maculation even though in some cases the color values are not quite perfect. We believe that the process, even with this imperfection, gives the best results attainable for any but the very small species. The author has wisely omitted descriptions and has been content to give notes in relation to food plants and distribution. The classification follows the recent literature of the best authorities on the subject. As a whole the work is well done, and the author has made a good selection from the abundance of material. When we take into consideration the fact that there are over 6000 species of moths in America north of Mexico it is a splendid contribution to the subject to have 1500 or more of them figured in one work. The book will be an absolute necessity in the library of every lepidopterist, and a valuable one to all persons interested in entomology or natural history in general.—H. S.

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**FIRST ANNUAL REPORT ON THE NOXIOUS INSECTS OF THE STATE OF ILLINOIS.** By Benjamin D. Walsh, M.A., Acting State Entomologist. From the Appendix to the Transactions of the Illinois State Horticultural Society for 1867. Second Edition.

The original report has long been out of print. Prof. Forbes says of it: "I am pleased to have the opportunity to issue a second edition of this useful and interesting document, to the number of one thousand copies, and I do not doubt that its republication at State expense is amply warranted by the intrinsic value of its contents, and by its importance as the first of a long series of reports of the official entomologists of this State." We are glad to see this reprint and fully endorse all Prof. Forbes has said about it. We quote from the preface as follows: "In a memoir intended for publication in the proceedings of some grave scientific society, it would, of course, be highly indecorous to break the

dreary monotony of scientific hair-splitting by a single remark, which had the slightest tendency towards extending that convulsive movement of the midriff, which the vulgar herd of mankind call 'laughter.' But as this Report is intended chiefly for the use of common folks, who do not think it beneath their dignity to indulge occasionally in a hearty laugh, I shall be pardoned, if I inadvertently here and there drop a word which may cause the cheek of the reader to mantle with a smile. Four hundred years ago Martin Luther said, that 'he could see no reason why the devil should run away with all the good tunes.'

"I can see no reason, in the year 1867, why the pestilent yellow-covered literature of the day should monopolize all the wit and humor. If there is one thing which I have at heart more than another, it is to popularize science, to bring her down from the awkward high stilts in which she is ordinarily paraded before the world—to show how sweet and attractive she is when the frozen crust in which she is usually enveloped is thawed away by the warm breath of Nature—and more especially to demonstrate how delightful that particular branch of science, to which I have devoted half a life-time, may be made to any one, who will keep his eyes wide open as he walks through his garden or his orchard. If I merely succeed in enticing away a single young woman from her mawkish novelettes and romances into the flowery paths of Entomology, or if I can only induce a single young man, instead of haunting saloons and lounging away his time at street corners, to devote his leisure to studying the wonderful works of the Creator, as exemplified in these tiny miracles of perfection which the people of the United States call 'bugs,' I shall think that I have not written altogether in vain."

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SYNOPSIS OF INSECT COLLECTIONS FOR DISTRIBUTION TO ILLINOIS HIGH SCHOOLS. Lepidoptera. By Charles A. Hart, Illinois State Laboratory of Natural History, Urbana, Illinois.

This work lists and briefly describes the commoner insects and those of economic importance. References are given after each species to figures and fuller descriptions in the literature of the subject. This method of issuing collections to schools is a most valuable method of instructing young people and will undoubtedly create a great interest in this branch of natural history among young people. We wish this method would be adopted in every State and Territory in the Union.—H. S.

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AQUATIC INSECTS IN NEW YORK STATE. *N. Y. State Museum Bulletin* 68, August, 1903, Part 3, *Life Histories of Odonata, Suborder Zygoptera, Damsel Flies*, by James G. Needham, pp. 218-263; *Appendix on Odonata*, pp. 263-276. James G. Needham; *Distribution of New York Dragonflies, Additional Data*, pp. 276-279, Dr. P. P. Culvert. Mailed about October 1, 1903.

In his remarks introductory to this bulletin, on p. 203, Prof. Needham states: "My chief contribution to this bulletin is the description of the life histories and habits of the damsel flies (order Odonata, suborder Zygoptera). I have been able to describe the nymphs of all our 10 genera and 23 of our 42 known species all these descriptions being new." And on p. 218 he continues, "Of these 23, three are Calopterygidæ, five are Lestiniæ and the remaining 15 are Agrioninæ; and fortunately the nymphs of all our genera are now known."

Directions and suggestions for collecting life history material in this sub-order are given on p. 219. Keys to families, subfamilies, genera and species of imagos and known nymphs follow. Detailed notes on the scope, range and general ecology of the larger groups are interspersed; and for each species the more important bibliography, special habits, and a description of the nymph, if known, are given. On page 222, in the key to species of *Calopteryx*, *amata* is stated to have the wings uniformly colored. As originally described by Hagen and as verified by the examination of a considerable number of specimens, adult males have the hind wings apically brown. On p. 245, a new genus, *Chromagrion*, is described for *Agrion conditum* Hagen, which, since 1876, has generally been written *?Erythromma conditum*. The genus is defined both for the imago and nymph, and finds its nearest affinities with *Erythromma* and *Pyrrosoma*. On p. 251 it is stated, "they (Enallagmas) do not, so far as I have observed, descend beneath the surface of the water in ovipositing." At Round Lake, Whitley County, Indiana, *Enallagma signatum* in couple has often been seen submerged; and see McLachlan, Ent. Mo. Mag. (2) Vol. 10, p. 207. On p. 253 the name *annexum* is retained for the species which, as determined by Calvert and Williamson, is identical with *cyathigerum*. *Agrion positum* Hagen, usually known heretofore as *Nehalennia posita*, is, with reason, taken from *Nehalennia*, (not *Nehalennia*, as in the bulletin under review) and placed in *Ischnura*, though it also shows affinities with *Enallagma*.

*Appendix on Odonata*, page 263: "During the past season there has been opportunity for making some further observations on the Odonata-Anisoptera. \* \* \* \* It is now possible to add descriptions of the nymphs of eleven additional species with new data on some of the others" discussed in Bulletin 47, New York State Museum, September, 1901, pp. 429-540. On page 264, the past confusion between *Gomphus fraternus* and *G. externus* may have resulted from a mistake made by Professor Needham in comparing his specimens with the Illinois State Laboratory specimens, rather than through an error by Hagen,—an error hardly possible in the light of the figures drawn by Hagen for the *Monographie des Gomphines*, Pl. 7, fig. 4, 1855, and Pl. 21, fig. 2, 1858. *Gomphus borealis* is now regarded by Professor Needham as specifically distinct from *G. descriptus*. *Gomphus dilatatus* is designated as the type of *Gomphurus*, and the remarkable nymph of this species is described. On p. 275, the habitats of the nymphs of 62 species of Odonates are given in tabular

form. It is of interest to note "that, while the majority of the species live in ponds or still water, the more generalized members of both suborders live in rapids of streams." Pages 276-279 by Dr. Calvert are notes supplementary to the two lists of N. Y. Odonata published by himself. At the present time about 125 species of dragonflies are known to occur in New York.

In Part 2 of this bulletin, on pp. 212 and 213, is a discussion of the ecology of *Æschna constricta*, especially with reference to its economic importance in relation to brook trout.—E. B. W.

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## Notes and News.

### ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

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*Melanoplus canonicus*.—Scudder describes this species from the "Grand Canyon of the Colorado, Arizona, (L. Bruner)." It ought to be recorded that the specimens, though from Prof. Bruner's collection, were collected by Prof. C. H. T. Townsend, who obtained them (according to a MS. note of his in my possession) down in the canyon, about 3000 to 4000 feet above sea level.—T. D. A. COCKERELL.

A THIRD TRIONYMUS.—In Mrs. Fernald's Catalogue of the Coccidæ there are two species of this genus recorded, one American, the other European. I find from an article by Sajo in *Zeits. für Pflanzenkrankheiten*, 1894, p. 151, that there is a third species, *Trionymus hordei* (*Westwoodia hordei*, Lindemann), found in Russia and Hungary. As this insect has apparently been overlooked by coccidologists, it is just as well to call attention to it.—T. D. A. COCKERELL.

In the Nov. NEWS, page 297, Mr. Philip Laurent doubts the capture of *Danaïs berenice strigosa* by myself at Miami, Florida. It would have been more logical for Mr. Laurent to have seen my specimens before expressing his convictions, as there is no doubt about var. *strigosa* being found there. I took about ten specimens of *Timetes petreus* at Miami which were identified for me as *eleuthea*. I did not discover until the present time that they had been erroneously determined for me as *eleuthea* and so published in my list.—MORGAN HEBARD, Chestnut Hill, Philadelphia.

I CAN GO Mr. Morgan Hebard and Mr. Ellison A. Smyth one better on the northern distribution of *Thanaos naevius*. I have in the collection of the Dept. Agriculture, a specimen determined as this species on authority of Dr. Dyar, which was taken by Mr. C. S. Brimley, at Raleigh, N. C., on May 18th, 1902.—FRANKLIN SHERMAN, Jr., Ent. Dept. Agr., Raleigh, N. C.

**THE DISTRIBUTION OF CATOPSILIA EUBULE.**—The range of this species seems to be attracting the attention of some of the readers of the NEWS, and, observing the note of Mr. Witmer Stone in the October number, I am tempted to say that having for a number of summers made my home at Spring Lake, New Jersey, and other points on the New Jersey coast, I never failed to find the insect quite abundant in August and September. In the summer of 1896 and 1897, it was particularly common, so that we ceased to pay any more attention to it than to the common *Colias philodice*. My friend, Dr. A. E. Ortmann, informs me that the species is very abundant at Princeton, New Jersey, in the fall, and that he has found the larvæ on its food-plant, *Cassia marylandica*, all through the Stony Brook valley, near Princeton. In western Pennsylvania it is scarce, but it has been taken a number of times in the vicinity of Pittsburgh, and I have a specimen taken as far north as Meadville, Pa. It occurs occasionally in Ontario and Wisconsin, and in the lower valley of the Ohio it is not at all rare.

By the by, the generic name of the insect is the one above given. The name *Callidryas*, according to the best usage, is confined to the species occurring in the old world and the name *Catopsilia* to the species of the new world. There is a clear line of structural difference between the Indo Malaysian and Ethiopian species on the one hand, and the Neotropical species on the other.—W. J. HOLLAND, Director Carnegie Museum.

**CATOPSILIA EUBULE NORTH OF PENNSYLVANIA.**—I have read with interest the remarks published from time to time in the NEWS regarding the northern range of *Catopsilia eubule*. Mr. Stone, in the November issue, remarks that he has not until this year observed it north of Cape May County, New Jersey.

More than twenty years ago I used to take this species near East Hampton, Long Island, where it occurred in September. It was not especially rare, though usually very difficult to capture, seldom alighting, but flying steadily across country or along the ocean beach. I never observed it more than a mile inland, where vegetation begins to grow more thickly. *Petunias*, *Gladioli*, and other flowers around the seaside cottages would occasionally tempt one of them and make its capture possible.

Summer before last (1902), for the first time, I observed *eubule* at Greenwich, Conn., near the shore of the Sound, and last summer several were seen, in October.

The remark of Scudder (Guide to the Butterflies, 1899), that the appearance of *C. eubule* in the northern States "may be entirely due to migration" seems to me at least very possible. Its habit of flight as observed on the Long Island coast would suggest this, and in this connection is another observation that has always impressed me; *C. eubule* is an extremely wary and strong flying butterfly when seen in this region, but in Florida it is not especially so. In fact, I have usually found it there among the easiest species to capture.—W. C. WOOD.

THE communication of Dr. Castle in the September number of the ENT. NEWS, page 244, to the effect that, while collecting in Florida, he there encountered a species of *Galerita*, which bombarded like the species of *Brachynus*, recalls the only experience of the same kind that I have had, and which now seems not unworthy of publication. Among a colony of about a dozen specimens of our common *Galerita janus*, congregated under a stone and found on the Chestnut Ridge in the spring of 1899, there was one that, much to my surprise, distinctly bombarded like a *Brachynus*. This it did but a single time, and no effort on my part could force it to repeat the performance. Ever since this occurrence I have been paying close attention to the various colonies of *Galerita* that I have met, but in no case did another evidence of their power of bombarding come under my observation, and hence I considered it anomalous and exceptional and not generally possessed by all the individuals of *Galerita janus*, or but extremely seldom employed by them when disturbed.

It would be interesting to ascertain whether, as implied, Dr. Castle has observed many, or at least several of the Florida *Galerita* in the act of bombarding, or, as in the instance here recorded, but a single specimen. P. JEROME SCHMITT, O. S. B., St. Vincent's, Beatty, Pa.

PROBABLY no State in the Union is more agitated over insect pests than is Texas; and in very few States is as much entomological work being done. On November 5th and 6th a Cotton Convention was called at Dallas, Texas, the principal subject of the discussion being the Boll Weevil and Boll Worm. This was the second session of this Convention, the first being held in December, 1901. At the close of the session, Prof. F. W. Mally, formerly State Entomologist of Texas, very hospitably entertained the other Entomologists in attendance. The following note given in the Texas Farm and Ranch is sufficiently accurate with the exception of some of the details of the menu:

ENTOMOLOGISTS' BANQUET.—“After the late Cotton Convention in Dallas, Prof. F. W. Mally, of Garrison, Texas, entertained a number of distinguished entomologists at a banquet at the Oriental. Among the guests were: Prof. W. D. Hunter, Victoria, Texas; Prof. Sherman, Raleigh, N. C., Prof. H. A. Morgan, Baton Rouge, La., Prof. E. Dwight Sanderson, College Station, Texas, and Prof. A. L. Quintance, Victoria, Texas.

Farm and Ranch was not furnished with a copy of the menu, but it assumes that it ran something like this:

Weevil au naturel.  
 Bouillon d'insecte.      Boll Worm Cocktail.  
 Weevil on the Square.  
 Bolls a la puncture.      Boll Worm Roti.  
 Cotton Stalk Tips.      Alkali Cotton a la Shear.  
 Big Bugs a la Wilson.      Cotton Blanche au Jester.      Exterminators.”

All of those present with the exception of Prof. Sherman of North Carolina and Prof. Mally, who is now engaged in the nursery and fruit business at Garrison, are actively engaged in entomological work in Texas. In addition to these gentlemen there are now working in Texas the following: As assistants to Mr. Hunter, Mr. W. E. Hinds, Mr. G. H. Harris and Dr. Morrill, Mr. A. F. Conradi, Assistant State Entomologist, and L. H. Scholl, in charge of the Experimental Station Apiary at College Station.

The work of the Division of Entomology of the Department of Agriculture and of the State Entomologist has resulted in demonstrating practicable methods of fighting the Boll Weevil and Boll Worm, and it is now largely a question of getting the cotton planters to adopt the improved methods of culture outlined.—E. DWIGHT SANDERSON, State Entomologist.

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## Doings of Societies.

A regular meeting of the Entomological Section, Chicago Academy of Sciences was held in the John Crerar Library, Thursday evening, November 19, 1903. Seven members present. Mr. Longley in the chair.

The election of an Honorary Curator of the Section being in order, Mr. Comstock nominated Mr. A. B. Wolcott.

No other nominations being made, the Recorder, on motion of Mr. Kurst, cast the ballot. Mr. Wolcott was unanimously elected.

No further business being before the meeting, Mr. W. L. Tower took the floor for a talk of entomological interest on Mexico.

JOHN COMSTOCK, *Recorder*.

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The Ninth Regular Quarterly Meeting of the Pacific Coast Entomological Society was held at the Cafe Odeon, 8 and 10 O'Farrell St., San Francisco, on the evening of August 15th.

President Fuchs in the chair.

Twelve members and eight visitors were present. Two new members were elected.

President Fuchs delivered his annual address, which was followed by the election of officers. Result: For President, Charles Fuchs; Secretary and Treasurer, F. E. Blaisdell; for Assistant Secretary, Leon Munier.

Mr. James Cottle reported his "Second Trip to Shasta," giving a list of the species captured—the following not having been included in his report given at the sixth meeting of the Society (see ENTOMOLOGICAL NEWS, vol. xiv, No. 2, p. 60): *Argynnis leto* and *rupestris*, *Satyrus sylvestris*, *Thecla melinus*, *Philampelus achemon*, *Deilephila lineata*, *Protoparce celeus* and *Sphinx perelegans*.

Prof. H. F. Wickham, being present, responded to a call by giving some observations made during his collecting trip, not then completed. Mr. Alex. Craw gave an account of his work in the introduction of parasitic insects.

Mr. George Coleman gave a talk on the ravages of *Dendrotonus*. Mr. L. E. Ricksecker exhibited a scolytid beetle that he has observed attacking fruit trees, on the shaded sides of the trunks and branches. Mr. F. W. Nunenmacher exhibited specimens of blown larvæ that showed great skill in the art.

Mr. James Cottle, specimens of *Sphinx lineata* with a very marked variation in color markings; Coleoptera: *Pityobius murrayi* ♂ and ♀, *Hylotrupes amethystinus*, *Pachyta spurca* and *Cychnus convergens* (= *opacicollis* Casey)—all four near Mount Shasta. Mr. J. C. Huguenin, specimens of *Argynnis adiante* (♀), *liliana* and a *Satyrus* near *sylvestris*—all from the Santa Cruz Mountains.

Dr. F. E. Blaisdell, a box of *Eleodes* (sub genus *Eleodes*), showing the new arrangement according to his recent studies.

F. E. BLAISDELL, M. D., *Secretary*.

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Minutes of meetings of Brooklyn Entomological Society, Brooklyn, N. Y. (Continued from p. 31, Vol. xiii.)

April 14, 1901.—Twenty-two persons present. Prof. John B. Smith presiding. Messrs. Eugene A. Bremser and Lawrence Ericson were elected members.

Announcement was made that the Trustees of the Brooklyn Institute of Arts and Sciences had conferred the title of Patron upon Mr. Edward L. Graef, by reason of the gift of his library and collection to that institution. Archibald C. Weeks read a paper upon the "Injurious Effects of Field and Forest Burning in Greater New York and Vicinity," showing that the



miscellaneous annual burning of meadow and woodland destroyed much organic matter, rendered the landscape unsightly, exposed the soil so that it became parched, caused the drying of small ponds and streams, killed young trees and plants, and destroyed more beneficial and harmless insects than injurious ones; while the destruction of plant and insect life caused many birds to be driven away.

Discussion by Messrs. Graef, Smith, Roberts, Watson, Wasmuth and Weeks.

May 2, 1901.—Twenty-four persons present. Prof. John B. Smith presiding. Messrs. Carl Schaeffer and G. N. Barber were elected members.

Lecture by Dr. R. Ellsworth Call, on "The Mammoth Cave and its Entomological Fauna," illustrated by lantern views, showing almost all the known species taken therein. Collecting was a matter of great difficulty, as the interior of the cave was absolutely dark, and the only illumination was by means of oil lantern. By this light the collector often laid face downward and captured whatever appeared to move. Cave crickets (*Ceutophilus*) were abundant more than a mile from the entrance. The organs of vision were lacking in most of the species of cave inhabitants; in many forms their position was indicated by pigment. With one or two exceptions, the cave insects differed completely from the out-of-door forms occurring in the vicinity.

June 12, 1901.—Twenty-six persons present. Prof. John B. Smith presiding. Messrs. Roy S. Richardson and Howard Bennett were elected members.

Prof. Smith presented a series of lantern views illustrative of "Some Notes on Economic Entomology in Europe," which he had obtained while on a visit abroad during the previous summer, and gave descriptions of the scenery and inhabitants, and of the methods of dealing with destructive insects.

October 3, 1901.—Twenty-four persons present. Drs. John L. Zabriskie and Otto Seifert were elected members. Discussion as to the introduction of *Samia cynthia* in the vicinity of New York, and the extent to which it was subject to parasitism. Mr. Johnson stated that the introduction of *S. cynthia*

in this locality was due to the fact that at one time the strain of *Bombyx mori* became depreciated, and in the course of experiments to provide a substitute, the United States Agricultural Department sent him one hundred cocoons. After three years' confinement, some of the larvæ were placed upon an *Ailanthus* in his yard; from whence the moths escaped and spread. For a number of years they were free from parasites, but were now subject to the same attacks as our allied native species. Sparrows destroyed the larvæ after the first moult, though but rarely after the second. Dr. Meeske and Messrs. Roberts and Weeks instanced the parasitization of *cynthia* by *Ophion macrurum* and a species of *Smicra*. Prof. Smith noted that this moth preferred to frequent the vicinity of large cities. This, however, might be due to the greater supply of food plant to be found in such localities. Mr. Akhurst related his experiments in breeding *jama-mai* for its silk. The insect so far, however, had refused to become acclimated.

Dr. Call read copies of two interesting letters: one by Edward Doubleday to S. Calverley, formerly of Brooklyn, dated at Epping, England, December 17, 1840; in which, among other things, Mr. Doubleday states that he is preparing a work on United States Lepidoptera, and had 967 species enumerated. The other was by Dr. Thaddeus William Harris to Mr. Calverley, dated at the Library of the University, Cambridge, Mass., November 16, 1848, written in response to Mr. Calverley's request for a copy of "Insects Injurious to Vegetation," and in which Mr. Harris inquires who had identified Mr. Calverley's specimens, as he did not "suppose there were five persons in the United States who could do it."

Dr. Call also read a paper upon the species of *Anopthalmus* occurring in the United States. Although there were a number of names, some were probably synonyms; which would reduce the actual number of species to eight. In fact, the generic name could be eliminated, and the several species merged with *Trechus*, since there were no structural differences upon which to base distinctions; the aborted eyes not being recognized as a generic character. Prof. Smith preferred retaining the generic name, because it was desirable to have a

distinctive nomenclature in cases in which peculiar features were present, even if little value had been assigned to them elsewhere.

*November 7, 1901.*—Twenty-nine persons present. Prof. John B. Smith presiding. Mr. John Kalbert was elected a member.

Prof. Smith spoke upon the structure, life history and destruction of certain species of mosquitoes. He made detailed explanation of their methods, the result of their attack and their position as purveyors of various febrile and malarial diseases. His remarks were illustrated by lantern views and embodied many of his original investigations and observations.

*December 5, 1901.*—Twenty-five persons present. Prof. John B. Smith presiding. The death of Dr. Herman Strecker was announced, and Messrs. Graef, Love and Weeks were appointed a committee to prepare suitable resolutions.

Dr. Love exhibited a box of Ichneumonidæ, and suggested the propriety of noting and preserving carefully all parasites emerging from pupæ, for the purpose of increasing our knowledge of this family.

Dr. Seifert exhibited some 750 bred specimens of *Arctia nais* supposed to be var. *vittata*, and related his experience in breeding from a gravid female which he took in Florida in March, and his inability to mate its progeny with *vittata* in this locality. He had also made experiments in rearing the larvæ of *nais* upon various food plants, and had subjected the pupæ of different broods to extremes of heat and cold.

Discussion as to effects of heat and cold and æstivation, by Prof. Smith, Messrs. Franck, Graef, Meeske and Weeks. Mr. Weeks instanced an *Acronycta* chrysalid found in March, 1901, the larva of which undoubtedly pupated in the fall of 1900, and which had so far failed to emerge, though still alive. (The moth proved to be *A. americana*, and appeared in May, 1902).

Mr. Franck exhibited a second specimen of *P. philenor*, var. *wasmuthi*, which had been taken in Flatbush the previous summer, and stated that a *S. cynthia* ♂ had been found in copulo with a *P. cecropia*.

ARCHIBALD C. WEEKS, *Secretary*.

At the meeting of the Feldman Collecting Social held November 18th, at the residence of Mr. H. W. Wenzel, 1523 South Thirteenth Street, Philadelphia, seven persons were present.

Mr. Beutenmueller stated that the American species of *Corymbites* hitherto referred to *C. vireus* of Europe, is not that species and must receive another name.

Mr. Haimbach exhibited a box of microlepidoptera including two specimens of *Trichotaphe nonstrigella* taken at Cincinnati, Ohio. This is a rare species hitherto only represented in collections by the type specimens.

Mr. H. Wenzel referred to Mr. Beutenmuller's paper on North Carolina Coleoptera, and stated that the typical *Cychnus violaceus* and the variety of that species figured therein are no doubt the two extreme forms of the species.

Mr. Dæcke recorded the capture of *Donacia floridæ* in large numbers on Hammonton Lake, N. J., August 23.

WILLIAM J. FOX, *Secretary*.

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A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held November 19th. Mr. H. W. Wenzel, Vice Director, presided. Fourteen members and two visitors were present. Twenty-one species of Dytiscidæ were presented by Mr. H. W. Wenzel.

Mr. C. B. Hardenburg stated that a circular would be sent to all collectors of insects in Pennsylvania requesting information in regard to all orders of insects with a view of publishing a catalogue of the species of the State with exact data. Mr. Rehn strongly advised the movement, and said a beginning should be made along the lines indicated. Dr. Calvert said he favored such a list and would gladly aid with the Odonata. Dr. Calvert also gave an account of the course on entomology he was giving at the University of Pennsylvania. While engaged in the preparation of the course he had become specially interested in the Termites. *T. flavipes* were found to swarm in about equal numbers as regards sex. None of the winged individuals ever produce young so far as had been observed in this species. Mr. R. Godfrey was elected an Associate.

HENRY SKINNER, *Recorder*.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XV.

FEBRUARY, 1904.

No. 2.

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## Notes on the Life History of *Culex Dupreei* Coq.

BY JOHN B. SMITH.

(With Plate VII.)

This is a small mosquito originally described from Louisiana, and it ranges in color from grayish brown to nearly black. The dorsum of the thorax is taken up by a silvery white stripe with diffuse edges, and this white is continued on the head; filling up most of the space between the eyes. It resembles *serratus* on a smaller scale; but the stripe is not so well defined and the maculation of the abdomen differs.

The species was first found in the larval stage July 29, 1903, by Mr. Clarence Van Deursen, an office assistant, in a woodland pool near New Brunswick, New Jersey. Several other species were associated with it, but this larva was at once recognized as distinct by its unusually long anal gills, the apparent absence of a breathing tube, and by its habit of remaining close

to the bottom. This is a singular character, and in confinement they have never been observed to rise voluntarily to the top, for air. When disturbed they sail rather than wriggle toward the surface; but immediately descend as soon as quiet is restored. So inconspicuous and transparent are they, that a jar containing them would be set aside as empty, unless critically examined, and this, together with their habit of hiding amongst the leaves at the bottom of the pools, renders them difficult to secure.

A number of pupæ were brought in with the larvæ July 29th, and from these came 1 ♂, July 30th, and 2 ♂, July 31st. Some specimens of the larva were preserved, others pupated and yielded adults August 2, 3 ♀; August 3, 1 ♀; August 4, 1 ♀; August 5, 1 ♂; August 6, 1 ♀. The period of the pupal stage averaged about 3 days and offers nothing abnormal.

Another collection was made in the same locality August 13th, and a mixed lot of nearly full grown larvæ and pupæ were secured. From the pupæ 1 ♂ adult emerged August 15th, and 8 ♂, August 18th; a very long period. Larvæ began to pupate August 15th, and adults were secured as follows: August 19, 5 ♂; August 20, 7 ♂ 1 ♀; August 21, 2 ♂ 1 ♀. The average duration of the pupal stage in this lot was 4 days.

September 3rd, another collection was made and larvæ were secured in an earlier stage; but these did not do well in confinement and only 1 ♂ adult was obtained, September 15th.

Full grown larvæ were again met with by Mr. John A. Grossbeck, one of my field assistants, September 9th and 10th, in woodland pools in the Great Piece Meadow, an extensive swamp area along the Passaic River in the northern part of Essex County. Pupation began at once and adults were obtained as follows: September 13, 8 ♂; September 14, 6 ♂, 3 ♀; September 15, 2 ♂, 2 ♀; September 16, 1 ♂, 6 ♀. This also gives an average duration of four days in the pupal stage.

Half grown larvæ were secured in the same place September 24th; but none were brought to maturity.

This record indicates continuous breeding from the latter part of July to the end of September, and of course it is prob-

able that the breeding began much earlier in the season and continued at least a little later. No adults were taken on the wing and no observations were made of any attempts at biting. Practically the species is of no importance: technically it is of the greatest interest.

The larva, figure 1 of plate vii, is whitish, almost transparent, and  $5.6\frac{1}{2}$  mm. in length. The head is almost twice as broad as long. Antennæ half as long as the head, almost uniform in thickness two-thirds from base, then tapering slightly to the tip where there are four articulated spines and a stout little joint. The hair tuft, figure 5, issues from a point slightly above the middle, and is sparse, not extending beyond the tip. At figure 2, is a drawing of the head beneath, made from a cast skin. The rotary fan tufts, figure 3, have the hairs pectinated at the tip; most obviously so toward the centre of the structures. The mandible, figure 4, and the mentum, figure 6, offer nothing of special importance.

The thorax is one and one-half times the width of the head, with the sides a little angulated: tufts as shown in the figure.

The anal siphon is  $4\frac{1}{2}$  times as long as its width at base and tapers rather evenly toward the tip. It is really a very inconspicuous affair in the larva and readily overlooked in the living specimen. At figure 1, its relation to the entire larva is brought out, and at figure 7, its relation to the immediate surroundings is shown. This drawing was made from a mounted cast skin, and the tube seems in consequence stouter than is really the case. There are 12 spines in each of the lateral rows, and their average form is shown at 9.

The lateral combs of the 8th abdominal segment consist of from 8 to 10 scales each, arranged as shown at 7, and individually like figure 8 on plate.

The anal gills are more than double the length of the anal siphon, slender, drawn to a point, with the tracheal tubes readily visible through the transparent walls under low powers of the microscope.

Altogether this is a very distinct little species in all the known stages. Of the egg, or of its method of hibernation, I have no information.

## Notes on Coleoptera.

BY CHARLES DURY, Cincinnati, Ohio.

### On *Melasini*.

I have taken here from time to time specimens of a *Nematodes* that was locally associated with *N. atropos* and *N. penetrans*. Its elytra and body beneath are black. Head and thorax reddish brown covered with golden hairs. Body shorter and stouter than *atropos*, with the thoracic foveæ round and much deeper. Antennal joints 4 and 5 short, not longer than wide. Joints 6, 7, 8, 9, 10 and 11 longer than wide. It has quite a different facies from either *atropos* or *penetrans*, and will come between them in Dr. Horn's table, given in his excellent monograph of the North American species of *Eucnemini* (Trans. Amer. Ent. Soc. 1886, p. 5.) In this paper Dr. Horn makes mention of such a species. Mr. Fleutiaux of Paris has suggested that it might be Bonvouloir's *Nematodes collaris*. After a comparison of the specimens with his (Bonv.'s) description of *collaris*, I am satisfied that it is that species. Bonvouloir gives Brazil and "La." as the localities, though mentions La. as doubtful. The three species of *Nematodes* we find here, have the same habits. They run rapidly on the trunks of dead Beech, Elm and Maple trees, hiding under the bark and in crevices. When disturbed they drop to the ground. They emerge from round holes which they cut through the wood. In his classification of this sub-family (Société Entomologique de France, LXX, 1901), Mr. Fleutiaux uses *Melasinæ* instead of *Eucneminae*. In revised list of Coleoptera observed near Cincinnati, Ohio (Journal Cin. Soc. Nat. Hist. XX No. 3), I have enumerated twenty-five species of this sub-family, the result of over twenty-five years' collecting. I thought I had taken all the local species, but was surprised June 10, 1903, to find a large well-marked species that had hitherto escaped observation. It proved to be *Hylochares nigricornis* Say. They were cutting their way out of the trunk of a huge dead White Elm, (*Ulmus americana*) making round holes. The area of emergence was about 6 x 24 inches, and from this spot I secured 107 fine specimens. The species is well described in Horn's paper referred to, but the extreme of size in



my series is 5 to 10 mm. *Stethon pectorosus* occurred from June 28 until July 7 on dead elm. I took two specimens of *Adelothyreus dejeanii* Bonv. running on the trunk of dead Beech. *Nematodes atropos* and *penetrans* both occurred, June and July, on dead trees and logs, the former rare and the latter common. Mr. Blanchard of Tyngsboro, Mass., reminds me that in Revised List Cin. Coleop. I had overlooked the fact that *Fornax hornii* Bonv. was the other sex of *calceatus* Say, as mentioned in my former list, and the genus *Tharops* has been superseded by *Isorhipis* (See Biologia Vol. 3, pt. 1.) This makes twenty-eight species of the sub-family occurring here.

#### Rediscovery of a Lost Species.

While collecting insects in a Beech woods near this city June 24 to July 8, 1903, I observed a bright green chrysomelid running rapidly over the leaves of "Boneset" (*Eupatorium ageratoides*.) The beetle was very shy, taking flight quickly if approached. By rapid strokes of a butterfly net I captured 31 specimens, both males and females. An examination reveals some characters of considerable interest. I feel satisfied that the species is Say's long lost and doubted "*Galeruca dorsata*" (See Horn's *Galerucini*, Trans. Amer. Ent. Soc. xx, p. 132.) Say gives the "Arkansa above the Viridigris," as the locality of his type. The female is  $\frac{1}{4}$  inch long, as given in Say's description, but the male is a little less. The color is bright green, shining. By oblique light it changes to deep blue. There is a pale border around the elytra. Say's description fits the female well. He evidently did not see the male, as he does not mention the remarkable male characters, which are, a large deep fovea with a short groove leading into it, situated near the suture, a short distance from the apex on each elytron, and a curious modification of the antennal joints 5-6 and 7 best shown in the drawing.



The species seems to be a *Diabrotica* and not *Galeruca*, and should stand as *Diabrotica dorsata* (Say.)

## Notes on an Elm Leaf Case-bearer, *Coleophora limosipennella* (Duponchel.)

BY WALTER W. HOOVER, Brooklyn, New York.

I met this little insect for the first time in the latter part of June, 1902, and have observed it pretty closely from time to time since then. My attention was first attracted to it by the numerous little brown patches on the leaves of the English Elms (*Ulmus campestris*) in Prospect Park, Brooklyn. An examination of the leaves revealed the fact that the patches were made by a case-bearing insect, the larva of a small moth belonging to the genus *Coleophora*. The exact species I could not determine at the time but I now believe it to be *limosipennella*.

The case-bearers were first noticed in Prospect Park about 1894 or 1895, but it is not improbable that they existed here long before that, but had not become numerous enough to attract attention. They are now found in nearly all parts of Prospect Park, and in several places in Brooklyn outside of the Park, but they occur in greatest numbers on the English Elms on what is called South Lake-Drive. While showing a decided preference for the English Elm I have found them on the American Elm, and on the Camperdown Elm. This decided preference for the English Elm leads me to believe that like the Elm-leaf Beetle, which also prefers the European Elms but has become a formidable foe to the American Elm, this case-bearer is also an importation from Europe.

The case-bearer is only about  $\frac{3}{8}$  of an inch long and the case is about  $\frac{1}{2}$  inch in length. The case is made from a portion of the leaf and resembles both in color and shape a diminutive cigar.

The manner of feeding is rather interesting and is somewhat as follows: The caterpillar selects a place almost invariably on the underside of the leaf usually near a vein branching from the midvein; here it fastens the case and proceeds to make a small round hole in the skin of the leaf. As soon as the epidermis is eaten through and the hole thus made is large enough to admit its head, the caterpillar begins feeding upon

the soft green tissue which fills all the space between the upper and lower skins and the large veins. Usually they eat out all the mesophyl between two parallel veins and as far as they can reach in the other two directions without entirely leaving the case. It will be remembered that the case is attached to the leaf and its door is exactly over the hole in the epidermis. Once or twice I have seen a caterpillar voluntarily leave the case altogether, but usually they keep a tight grip upon the case, and when disturbed duck back into it with surprising rapidity.



Adult moths emerged from the cases on July 19th and continued coming out for about two weeks. They are light grey in color with beautifully fringed wings. They spread a little over half an inch. I kept a number of them in my breeding cage hoping to get some eggs, but in this I was disappointed.



On July 31st I found a minute yellow speck on an elm leaf which under the microscope proved to be a mass of deeply pitted lemon yellow eggs. Since none of the eggs hatched I am not sure what they were, but as they closely resembled the eggs of another species of *Coleophora*, as described by Professor Slingerland, I am inclined to believe that they were the eggs of this species.

Although none of the eggs hatched in my cages, young case-bearers were abundant on the English Elms during the first week in August. They evidently construct their cases almost as soon as they are hatched, for I have never been able to find one without a home. The young brood do not differ materially in habits from the old. They construct their cases as neatly, and in the same manner as the spring brood did.

With the approach of Autumn I was anxious to know whether the case-bearers would fall with the leaves, as in that event they could easily be destroyed by gathering the leaves and burning them. I was lead to hope that such would be the case, since in my breeding cages they adhered tenaciously to the leaves even after they had withered and become quite dry. In fact I often had to detach them from the dry leaves and place them upon the fresh food in order to keep them alive.

I found, however, that by the middle of September, several weeks before the leaves dropped, the case-bearers were already firmly attached to the stem. Clustered around the bud at the base of the petiole of the leaf upon which they had lived, they passed the winter, ready to begin work upon the unfolding leaf which the first warm days of Spring should bring out. Thus they passed the Winter not as pupæ but as hibernating larvæ.

With the advent of Spring the caterpillars begin to feed upon the unfolding leaves. Soon they feel the need of larger quarters, but instead of building an addition to the old case, each caterpillar makes a new case. The case-bearer selects a place near the edge of the leaf and usually near the base, attaches its case and begins to make a burrow in the soft green tissue just as it normally would in feeding except that it does not eat out so large an area as it ordinarily would, but simply makes a burrow large enough to accommodate itself comfortably and enough more to allow for growth. It then weaves a silken web all around the interior of the burrow except at the hole where it entered, which is left as the mouth of the case, and a narrow slit at the opposite end which serves as a back door for the exit of excrement. The new case is still attached to the leaf, but in a day or two it becomes dry and brittle, and the wriggling of the caterpillar causes it to break away from the rest of the leaf, and soon the caterpillar walks off carrying his case with him.

The life of the case-bearer during the next few weeks may be briefly described as spent in eating, resting quietly suspended on the under surface of a leaf, and in seeking a new place to feed. It is a curious sight to see one of these little insects moving along a leaf with its case held out at a right angle with the surface of the leaf upon which it is moving; it reminds one of a very small Bag-worm, *Thyridopteryx ephemeraformis*.

By the first week in July the larvæ pupate, remaining in the pupa condition about two weeks, and the adult moths emerge about the middle of July.

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MR. JAY ELMER BROWN died in February, 1903. He was an ardent collector of Lepidoptera and resided at Pasadena, California.

## An Unusual Injury by the Snowy Tree-cricket and Notes on its Feeding Habits.

By C. O. HOUGHTON, Newark, Del.

On May 28th, 1903, there was brought to the Station for examination the trunk of a young plum tree, something over an inch in diameter, which contained a great many small, round punctures scattered irregularly over nearly the entire surface. Surrounding some of these punctures were irregular depressed areas in the bark of considerable size and in some cases a considerable amount of a gummy substance had exuded from the wounds, entirely covering the apertures.

I had seen nothing of the kind before, and an examination of the literature at hand on the subject of insects affecting the plum and other fruit trees threw no light upon the matter. Examination of the punctures revealed in each the presence of a small elongate egg, or egg-case, set in obliquely with one end near the opening and wholly contained within the bark or very nearly so. I was not familiar with the eggs and the trunk was left upon a table in the laboratory to await further examination. While working in the laboratory that evening I chanced to see, running quite rapidly about on the surface of the bark, three orthopterous nymphs, slender-bodied, light in color and about a half an inch in length, including the antennæ, which were considerably longer than the body. A fourth one had not wholly freed itself from the egg-case, being still held by the antennæ and one of its legs. This left no doubt in my mind as to whether or not the others had emerged from some of the other punctures in the bark. I at once came to the conclusion that these active little fellows were the young of a species of tree-cricket and began to look up the literature on the subject. I found plenty of references to these insects and their injuries, but nothing that was at all comparable with the case in hand until I came to a bulletin by Dr. Hopkins,\* while connected with the West Virginia Agricultural Experiment Station, in which he gives some notes on *Oecanthus* sp. injuring branches of apple trees in old orchards. His experiences, up to the point of finding the eggs, were very similar to

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\* Bull. 50 W. Va. Agri. Expt. Station, p. 39 et seq.

my own, but as he had not seen the young, or been able to more than guess at the identity of the species, I was naturally anxious to bring the young crickets to maturity and thus establish the identity of the author of this peculiar injury. Accordingly I captured the four specimens, placed them in shell vials and carefully examined the trunk for more, but without success. Thinking that more might emerge during the night and not having anything at hand large enough to enclose the whole trunk of the tree, I tried the experiment of suspending it at some distance from the floor by means of a piece of fine wire fastened to it near the middle. I thought the young crickets would probably be too timid to jump from the trunk, but in this I was mistaken, if any emerged, (as was quite probable) for I found none upon it on the following morning. I soon found that the young crickets jumped readily and considerable distances shortly after emerging from the egg-cases.

Having a supply of aphides, principally from cherry trees, in the laboratory, I placed from two to six of them in the vials with the young crickets, and out of six which I put in one vial with a cricket but one was alive the following morning. On the 29th, I sawed the trunk into pieces about a foot in length and put them inside a glass cylinder, covered with cheese cloth, in order to secure any other crickets that might emerge. On the following morning I found five more young crickets, one of which was held by the hind legs in much the same manner as the one previously described. This one never succeeded in freeing itself and soon died. Doubtless this would have been the fate of the first one had I not helped to free it from its egg-case, and as it was it died later, within 24 hours and never was able to move about much. The other four were bright and active, and when resting usually sought light colored places, as a point where a limb had been cut off or the sawed end of one of the pieces, evidently realizing the protection afforded by such places.

When but a day old one of the crickets killed two good sized aphides and apparently sucked the juices from them, in a period of five or six minutes.

May 31st being Sunday I did not visit the laboratory, but on the morning of June 1st I found twelve or fifteen more crickets in the cylinder. Most of these were resting on the cheese cloth over the top of the cylinder.

Between June 1st and 8th about a half dozen more crickets emerged, but none were found in the cylinder after the latter date. Apparently the last specimen emerged on the night of the 7th. Thus the time of hatching had extended over a period of eleven or twelve days with me, but I estimated that probably one-half the young had emerged before the tree trunk had been brought into the laboratory.

A few of the young crickets died, probably more from lack of food than from any other cause, but on June 9th I had about twenty-three in good condition, most of them in shell vials, usually but one in a vial. On that day I noted the first case of cannibalism. An empty shell vial had been placed in a glass cylinder in which a few of the crickets were inclosed, and two of them had fallen into it. They had not been there long, but one—the larger—had killed and partly devoured the other. One or two other cases of cannibalism were noticed later, but only when there was a scarcity of food.

As was to be expected, feeding was done principally at night or in the evening, and they kept comparatively quiet during the day, but if very hungry and they were given fresh food they would usually feed at any time. After a night's feasting the slender-bodied active insects would be transformed into sluggish creatures with greatly distended abdomens.

As they grew older they apparently became accustomed to being handled, and exhibited but little signs of fear when being changed from vial to vial or when having their food supply replenished. Occasionally one would jump, and the distance to which it would leap and the suddenness of the movement would cause me to wonder that they did not all escape from captivity at some time or other.

They were always very cleanly in their habits, and it was quite amusing to see them cleaning their long antennæ by slowly drawing them through their mouth parts or to see them reach their heads back under their bodies in their efforts to

remove, by means of their mouth, any particles of dirt that might have become attached thereto.

On June 12th I left Newark for a month's vacation at my home in northern New York, and took my entire colony of twenty odd crickets along with me. They were placed singly in shell vials holding about six drams, tightly corked, and a number of aphides, with a little vegetation, were enclosed with each.

Up to this time they had been fed principally on aphides from cherry and peach trees, but with a change in section of country a change in food was necessary, and during their month's stay in northern New York their food consisted almost entirely of the currant aphid.

I soon found that the shell vials were too small for my captives, as some lost their lives by becoming fastened by their long antennæ to the sides of the vials, apparently rendered sticky by the moisture from the vegetation enclosed, and the honey-dew from the aphides. Accordingly the survivors were transferred to jelly tumblers turned bottom upwards over pieces of paper; usually but one was placed in a jar, as I feared more cases of cannibalism. I was not able to watch them very closely, so could not get any very definite molts, but the first sign of wings appeared on an individual in which one of the moults occurred on July 4th. The wings appeared at that time as little pads in which state they remained for a considerable length of time. The skin cast by this individual at this time was only partially eaten, I think.

On July 8th I left home for Newark, and at that time had but seven living crickets. The plant-lice on the currant bushes having at this time practically disappeared, I found it necessary to look for other food for them on their trip back to their native State, and found this in the shape of some large plant-lice on rose bushes.

These seemed to "fill the bill," and all of the crickets reached Newark safely. There the food question was a greater problem than at Potsdam, for it was next to impossible to find plant lice of any kind. I succeeded in finding a few colonies on young pear trees, but these were soon gone, and I was



forced to look elsewhere. A garden weed yielded a very few large lice of a species not previously fed to them, and these were eaten like the others. It was not long however, before I found it impossible to find even these, and I began to despair of ever bringing any of the crickets to maturity. On July 20th I had but three left, and one of these was rather small and unpromising. With their natural food supply exhausted I thought the case nearly hopeless. It then occurred to me that perhaps they might eat insects other than plant-lice, so I captured some specimens of *Pieris rapæ*, snipped off their wings, cut the bodies partly open and placed them in the jars with the crickets. On the following morning I found to my great satisfaction that they had been feasting upon them. Later, house flies were added to their menu, and were fed upon, and this, in one case at least, in the afternoon. On the night of July 24th, the largest one of the three specimens moulted again, and on the morning of the 25th, I found a full-grown female specimen of *Oecanthus niveus* DeGeer in the jar.

In looking over the literature on the species I had found in one of Prof. C. M. Weed's reports\* while Entomologist for Ohio, the statement that *Oecanthus niveus* is carnivorous when young, but "when full-grown, however, the insect becomes a vegetarian." † I had been feeding my adult specimens principally upon a diet of flies, but thinking that possibly a vegetable diet might be preferred, I placed in the jar one night several kinds of young and tender leaves and a single house fly. The leaves were small and were carefully examined, so that had any part of them been eaten I could have easily detected it. On the following morning only the wings of the fly remained; the leaves were untouched. This specimen lived until August 4th, and so far as I could ascertain no vegetable matter was ever eaten though various kinds of leaves were placed in the jar with her.

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\* 7th Ann. Rept. Ohio Agric. Expt. Station p. 155.

† It is but fair to Prof. Weed, however, to add that in his "Insects and Insecticides," published soon after this Report, he states that these insects "feed upon plant-lice and other insects during their entire existence."

## Notes on some Orthoptera from British Columbia.

BY A. N. CAUDELL, Washington, D. C.

The collecting trip to British Columbia made this Summer by Dr. Dyar, Mr. Currie and myself, while generally successful, was a dismal failure orthopterologically so far as actual number of species taken are concerned. Less than one hundred specimens were collected and over a third of these were *Melanoplus atlanis*. This widely distributed species occurred rather commonly in the valleys visited; but its congener, *M. femur-rubrum*, was not often met with in the vicinity of Kaslo, where most of our collecting was done. *M. dawsoni* var. *tellustris* and *M. fasciatus* were also taken, but in limited numbers. The former was raised from nymphs collected above the snow banks back of Bear Lake at an altitude of about 6500 feet on July 29th, the adults issuing on August 12th. *M. fasciatus* was taken at Mirror Lake, a small lake a couple of miles below Kaslo, on July 17th.

Besides *Melanoplus atlanis* but one grasshopper occurred in any considerable number, *Circotettix suffusus*. The first mature specimen of this was taken at Kaslo on July 13th. One specimen belonging to this genus was referable to Kirby's species *verruculatus*. These two species are very nearly related and will very probably prove to be forms of the same species.

*Camnula pellucida*, often so injuriously common in some localities, was seen but twice, a mature female being taken at Kaslo on August 5th, and a nymph on June 24th.

Of grouse-locusts three species were taken, *Tettix granulatus*, *T. crassus* and *T. brunneri*. *Brunneri* occurred in both the macropterous and the brachypterous form. I owe its determination to Dr. J. L. Hancock who will later describe the long winged form, which he writes me is new. *Crassus* has previously been reported only from Michigan, Nebraska, Colorado and New Mexico. The single specimen taken by us agrees with authentic specimens of this species identified by Hancock.

I take this opportunity of expressing my perfect inability to use Dr. Hancock's synoptic tables. They seem carefully prepared, yet the dichotomous method is not consistently pur-

sued. It is to be greatly hoped that Dr. Hancock will, in a promised supplement to his otherwise valuable monograph, revise his tables and present them in the ordinary form.

Among the rarer species of Orthoptera taken by us in British Columbia may be mentioned *Podisma polita* and *Ceuthophilus henshawi*. The former was taken on the Kitchener Glacier on Mt. Kokanee on August 10th. *C. henshawi* was taken in numbers at sugar at Kaslo during the months of June, July and August. They came out after dark, and after eating of the mixture of beer, rum, molasses and sugar until they were stupid, fell an easy prey. These "drunken ceuthops," as Mr. Curris and I facetiously nicknamed them, were so numerous at sugar that several dozens might have been taken in one evening. Though so much in evidence at night I saw few during the day time, in fact I saw no more than half a dozen specimens during the many days of diligent search spent in that region. This remarkable species seems worthy of generic distinction.

*Cyphoderris monstrosa* was also a much prized capture. An immature, but almost full grown, female specimen of this rather interesting species was found by Dr. Dyar at Ainsworth. It was found floundering about in a wagon track on a damp mountain trail. This specimen agrees with the adult, a specimen of which was kindly presented by Dr. Fletcher, except that the wing pads are still smaller and the pronotum does not extend back so far over the basal segment of the abdomen. This immature specimen was taken on July 10th, and the adult given me by Dr. Fletcher, was taken at Banff, Alberta, on August 8th.

Cockroaches thrive in British Columbia as they do almost everywhere. The common species there seems to be the German roach or croton bug, *Blattella germanica*. They are in every thing, even the food. On this trip I had them served to me in three different styles, alive in strawberries, a la carte with fried fish and baked in biscuit. In justice to our amiable host of the Kaslo Hotel, where we stayed most of the time, be it said that these little appreciated delicacies were not served at his table.

## Wisconsin Bees: Genus *Andrena*.

BY S. GRAENICHER, Milwaukee, Wis.

The three species described below bring the number of new species of *Andrena* from Milwaukee County, Wis., up to seventeen. My sincere thanks are due to Prof. T. D. A. Cockerell for the interest taken in the study of these bees, as also for the very liberal aid given me in various ways.

### *Andrena fragariana* n. sp.

♀.—Length about 6 mm. Black. Pubescence whitish, thin, and of moderate length. Head broad, distinctly striate below the ocelli. Facial foveæ narrow, extending below the base of the antennæ, and containing light-brown pubescence. Cheeks narrow. Clypeus slightly convex, shining, with sparse, shallow punctures. No median impunctate line. The pubescence is short and sparse on the clypeus, longer on the cheeks and sides of the face. Process of labrum short, semicircular. Flagellum somewhat testaceous beneath. Joints 4 and 5 subequal, both together about as long as 3. Mandibles reddish at the tips. Mesonotum dull, finely roughened, with shallow, hardly visible punctures. Pleura and sides of metathorax clothed with long white hairs, while those of the mesonotum are rather short and thin. Enclosure of metathorax moderately broad, defined by impressed lines, coarsely roughened throughout. The sculpture of the surrounding area is much finer. Wings yellowish hyaline, stigma and nervures testaceous. Second submarginal cell more than one-half as long as third, receiving the first recurrent nervure at or slightly before the middle. Tegulæ testaceous exteriorly, of a darker shade than the stigma. Legs black, with short white hairs. Tibial scopa also white. The small joints of the tarsi are somewhat ferruginous. On the inner side the basal joints are covered with light yellowish pubescence. Abdomen shining, broad and flattened, with poorly developed apical hair-bands, and narrowly testaceous apical margins. Upper surface of segments minutely tessellate, without punctures. Anal fimbria inclined to fulvous.

♂.—About 5 mm. long. Very closely resembling the female. Pubescence more cinereous than in the other sex, also longer and more dense on clypeus, cheeks, pleura, and sides of metathorax. Cheeks regularly rounded. Joint 3 of antennæ about as long as 4 + 5. Second submarginal cell narrower than in the female, and apical margins of abdominal segments more distinctly testaceous.

Milwaukee, Wis., 10 ♂ and 16 ♀ specimens, collected from May 15 to June 15, 1903, on the flowers of our commonest wild strawberry, *Fragaria virginiana*. This bee is an oligotropic visitor of these flowers, and has not been observed on the flowers of any other plant.

The female might be mistaken for that of *Opandrena zizia*, but the facial fovea is much narrower, the metathoracic enclosure narrower, but more coarsely sculptured, and the anal fimbria considerably lighter than in *O. zizia*. Besides, the latter has a greenish reflection, which is especially noticeable on the scutellum and postscutellum of local specimens, and it is a somewhat larger insect. *A. fragariana* is the smallest species of *Andrena* sens. lat. occurring in our locality. The male of this species, with its black clypeus, is at once separated from the white-faced male of *O. zizia*.

***Andrena wheeleri* n. sp.**

♀.—Length 8 mm. Body black, covered with thin, whitish-yellow pubescence, except on mesonotum, scutellum and postscutellum, where it becomes distinctly ochraceous. Head as broad as thorax, with extremely broad facial foveæ. The pubescence of the latter light ochraceous, when viewed from the side or from above. Front below the ocelli minutely striato-punctate. Vertex and cheeks finely roughened, impunctate. The pubescence is moderately long on sides of face, vertex, and cheeks, short and scanty on the clypeus. The latter is somewhat shining, with an impunctate area in the middle. Punctures on the sides of the clypeus small and crowded, becoming large and sparse towards the middle. Process of labrum rounded. Joint 3 of antennæ equal to 4+5. Flagellum clavate, reddish beneath towards the tip. Mesonotum and scutellum faintly shining, with sparse, small, shallow punctures. On the mesonotum the hairs are erect, short and scattered, while those of the scutellum and postscutellum are rather long and brightly colored. Metathoracic enclosure broad, roughened, rugose at the base, with impressed smooth lines at lateral borders. Surrounding surface more finely roughened. Wings hyaline, with a yellowish tint. Nervures, stigma and tegulæ testaceous, the latter dark brown anteriorly. First recurrent nervure entering the second submarginal cell at the middle. The latter nearly quadrate, about half as long as third. Legs dark brown, inclining to testaceous on the posterior tibiæ and tarsi. Yellowish pubescence of the legs nowhere abundant. Abdomen broad oval, shining, bare, without a trace of hair-bands. Segments 2, 3 and 4 depressed more than one-third. Depressions impunctate, the remaining parts with very small, not close punctures. Anal fimbria fulvous.

♂.—Length 7 mm. Pubescence more uniformly whitish-yellow throughout than in the female, and longer on clypeus, cheeks, and mesonotum. Cheeks regularly rounded. Joint 3 of antennæ considerably shorter than 4+5, hardly longer than 5. Nervures and stigma darker, and apical depressions of abdominal segments narrower than in female, less than one-third the length of the segment.

Milwaukee, Wis., 3 ♂ and 13 ♀ specimens, taken on the flowers of *Tenidia (Zizia) integerrima* and *Thaspium trifoliatum aureum*, from June 8 to June 18, 1903. This is undoubtedly an oligotropic bee of the *Umbelliferae*. It is named in honor of Prof. Wm. M. Wheeler, who, within the last few years, has contributed so largely to our knowledge of North American ants.

***Andrena persimilis* n. sp.**

♀.—Length about 9 mm. Black, with dirty white pubescence on head and thorax, and grayish-white hair-bands on the abdomen. Facial foveæ moderately broad, covered with light pubescence. Clypeus shining, with small and close punctures, and a narrow impunctate median line. Process of labrum truncate. Cheeks considerably swollen, shining, thinly pubescent. Flagellum rufo-testaceous beneath near the apex. Pubescence of thorax long and thin, partly concealing the surface. Disc of mesonotum and scutellum highly polished, with very minute punctures; metathoracic enclosure defined by impressed lines. Its surface, as also that of the surrounding parts, dull and rather smooth. Legs dark brown, with white hairs, those on the inner surface of the basal joints of hind tarsi yellowish. Tibial scopa dense, plumose. Wings clear white, with dark nervures. Tegulae and stigma testaceous, the latter less than half as wide as the marginal cell. Third submarginal cell shorter than the first, but nearly three times as broad as the second, which is hardly narrowed above, and receives the first recurrent nervure behind the middle. Abdomen shining, flattened, broad and oval, without punctures. Continuous broad hair-bands of white appressed pubescence on segments 2 to 4. Anal fimbria dirty-white, with a reddish tint.

Milwaukee, Wis., one female, taken August 24, 1903, collecting pollen on the flowers of *Solidago canadensis*. The structure of the tibial scopa places this species in the genus *Pterandrena* Rob. In many respects it answers the description of *A. distans* Prov., but differs as follows: wings distinctly clear, stigma pale testaceous, not ferruginous, second submarginal cell hardly narrowed above, and abdominal hair-bands composed of short, appressed pubescence (long in *distans*).

***Andrena parnassiæ* Ckll.**

*Andrena parnassiæ*, Cockerell, Ann. and Mag. Nat. Hist., 7, IX, 105. ♀,  
♀.—The females are mostly larger than the type, some of them reaching a length of nearly 10 mm.

♂.—Length 8 mm. Head enormously developed, much wider and higher than the thorax. Cheeks broad and shining, moderately convex,

with a rounded angle above the middle of the eye. Margin of the angle reflexed. Upper part of cheeks bare, joint 3 of antennæ longer than 4 + 5. Mandibles long, slender and distinctly curved. A distinct notch remote from the tip. Pubescence longer and more whitish than in the female, black on vertex and mesonotum only. Hair-bands of abdominal segments very poorly developed.

Milwaukee, Wis., 5 ♂, 20 ♀ specimens. This bee flies from August 25th to September 26th. The size of the head of the male is very remarkable. In this respect the male surpasses the male of any other species of *Andrena* sens. lat. known from this locality.

***Andrena viburnella* Graen.**

*Andrena viburnella*, Graenicher, Can. Ent., XXV, 165. ♀.

♀. The second submarginal cell is very large, in most cases fully as long as third.

♂.—Length 8–10 mm. Pubescence lighter than in the female, dirty-white. Punctuation finer and closer. Cheeks broad, evenly rounded. Antennæ rather short, and stout for a male, joint 3 not quite as long as 4 + 5. Wings with a ferruginous tint. Nervures and stigma distinctly light ferruginous. Second submarginal cell shorter than in female, about two-thirds as long as the third on cubital nervure. In the smaller specimens the legs show hardly any ferruginous coloration at all, while in the larger ones this color is present on all the tarsi, the tips of all of the tibiæ, and the bases of the posterior tibiæ. Slightly developed hair-bands on the margins of abdominal segments 2 to 5, widely interrupted on 2 and 3.

Milwaukee, Wis., 6 ♂, 8 ♀ specimens, taken from May 29th to June 20th, on the flowers of *Viburnum lentago*, *Rubus villosus*, and *Thaspium trifoliatum aureum*.

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WE HAVE received a blank renewal blank from Montreal, Canada, and wish we were mind readers. Send us your name so we can give you credit for \$1.00.

WHITE vs. BLACK PINS.—My insect room is very hot and dry, during the summer months. The high temperature has so hastened greasing of the specimens, and the formation of "green oxide" on the white pins, that I have been obliged to discard them, and use the black japanned steel pins. These have the advantage of being sharp and stiff, though they are not very smooth; however they work well in this very dry room. But while at Brownsville, Texas, during last April and May, the black pins rusted badly. I am sure a long stay in such a damp locality would ruin them.—CHARLES DURY.

## Observations on *Bembecia Marginata* var. *Albicoma* and *Sesia Acerni*.

BY HENRY ENGEL, Pittsburgh, Pa.

For several seasons I have been on the lookout for *Bembecia marginata* in this vicinity, but had no success until I found part of an empty pupal shell protruding from a dead cane of red raspberry on June 28, 1903. On further examination of the cane and roots, the feeding habits were noticed, and a search for larvæ resulted in finding three in a small patch of red raspberry. From that date to July 22, nearly every day, one to two hours were devoted to hunting larvæ and pupæ of this species, resulting in the discovery of two hundred and forty specimens. These were found in a comparatively small area in a ravine having clusters of blackberry bushes here and there. Only five were found in raspberry bushes. Both sexes of the typical form and also of the var. *albicoma* occurred among the imagos resulting from the pupæ collected. Apparently the female of the variety *albicoma* was unknown when Mr. Beutenmüller concluded his Monograph of the Sesiidæ. A brief mention of its points of difference from the typical form is appended.

### ***Bembecia marginata* var. *albicoma* Hulst, ♀.**

Head, thorax and abdomen sooty-black, all lines and markings on collar and thorax reduced and straw-yellow. The line which crosses and ends in a triangular patch on each side of thorax in the typical form is interrupted in *albicoma*, extending only to lateral lines above the intersection of the primaries. The rings on the first three segments are only faintly indicated on top and are narrower on the under side than in *marginata*. The tuft of hair on the dorsal part of the third segment is all black. The rings on the abdomen and last two segments are straw-yellow, with black hairs intermingled on the last two segments. The legs are clothed with brown hairs. The margins of the wings are somewhat darker brown than in *marginata*.

Ova of *marginata* were obtained. The following description has been prepared by Dr. W. J. Holland :

“Eggs of *B. marginata*: .80 mm. in length; .60 mm. in width; oblong oval viewed from above; greatly flattened on base, and flattened ovate viewed laterally; profusely covered with minute, irregular, reticulated ridges enclosing deeper pitted depressions. Deep chestnut-brown in color.”



Interesting points in the habits of this species were observed. The time of day when they emerge differs from all Sesiids known to me. The males emerge from noon till 4 P.M., the females from 3 to 5 P.M. No notice was taken of this unusual behavior when two males emerged on August 8th and 14th, respectively, but when eight males and one female appeared during the afternoon of August 15th, my interest was aroused and I determined to learn their mating time. The males were bottled and the female placed in a cage and exposed all day August 16th. She remained inactive until 3 P.M., when, in a clumsy manner, she commenced flying about the cage. At nearly 5 P.M. the first male appeared, and more at short intervals until 6 P.M., when I had taken fourteen. A male was placed in the cage, and copulation took place, which lasted till 8.45 P.M. Subsequently I mated a number of pairs, but copulation never lasted more than forty-five minutes to one and one-half hours. From August 22d onward females were exposed every day, but males never appeared as early as the first day the experiment was tried.

Mr. Beutenmüller, in his Monograph, p. 226, under the heading "*Habits of Imagos*," expresses the view that *marginata* is probably nocturnal in its habits. He came close to it. In all the experiments, excepting the first day, males were attracted from 6 P.M., sometimes 6.15 P.M., till 7.20 P.M., when it was quite dusk. This, however, is as far as its habits approach the nocturnal stage. After copulation they remain inactive until the following day, when about 10 A.M. several females became active and deposited a few ova on the screen of the cage. In the field I have seen only two females. These were found about 2 P.M. on September 6th, resting on leaves of hawthorn and blackberry, respectively. Mr. Zahrobky, of Wilmerding, Pa., observed the female flying about noon depositing ova on the base of blackberry canes. About one hour after emergence the males take to the wing and must be removed from the cage, otherwise they quickly reduce their wings to fragments. The pupæ and imagos show a remarkable variation in size. The male imagos range from 17 mm. to 26 mm., the females from 26 mm. to 32 mm., with a corre-

sponding variation in the bulk of the abdomen. This, no doubt, is caused by abundance or lack of food. Taking the difference in size of the male and the female into consideration, all the larvæ found in vigorous and strong plants were of uniform size. In the district where I collected these larvæ and pupæ is a miniature mountain of coal-slack on which stunted and dwarfed bushes exist. Although the canes were scarcely thick enough for the larvæ to form their pupal cells, nearly every bush harbored a larva. All these were smaller in size. Right after the change to the pupal stage the pupæ are cream-colored, but change gradually to reddish brown in the course of two days. The larvæ and pupæ were left in sections of roots or in a part of the cane, and these were placed on damp soil in the cage, but nearly one-half of the number collected succumbed to the unnatural conditions. Some of the larvæ perhaps were not mature when carried in. From 240 in all, 129 examples emerged, as follows: 71 males and 39 females of *marginata* and 9 males and 10 females of the var. *albicoma*. There were 168 males attracted to females, of which number 29 were *albicoma*. The two forms readily interbreed. I have mated female *marginata* and male *albicoma* and vice versa. Larvæ and pupæ were collected from June 28th to July 25th. The first pupæ were found on July 2d. By July 20th the majority were in the pupal stage. The first imago emerged August 8th, with males strongly in the majority until August 25th; after that females were more numerous. The last few days of August are the height of their period of flight. Females exposed on August 29th to September 3d attracted only eleven males. Stragglers appeared in the cage up to September 12th, mostly all females. The pupal stage lasts from twenty-five to thirty days. Males attracted by females could be seen from some distance; they have a slow and hesitating flight and carry the antennæ erect when on the wing. Males of *albicoma* are readily distinguishable from *marginata* even when flying. The rings on the abdomen in newly emerged males of *albicoma* are nearly white, and contrast strongly from the deep-black abdomen; but, as in all Sesiids, the lustre of

their markings soon fades after death and leaves the colors duller.

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Concerning *Sesia acerni*, Mr. Beutenmüller, in his Monograph of the Sesiidæ, on page 296, writes: "According to Mr. Hulst, the eggs are probably laid at night. The moths emerge soon after sunrise and are on the wing a few minutes after emerging from the pupæ."

My observations on this species totally disagree with this statement, and I recount what I have observed. Occasionally we find a lonely example of this species in a woods where different species of maple grow. To find them in abundance we must seek the silver maple, *Acer dasycarpum* Ehrhart, which is extensively used as a shade tree in suburban sections of cities. In Knoxville Borough, near Pittsburgh, nearly all of the streets are lined with this maple. Here I have observed and collected *acerni* for many years. Often from 50 to 100 empty pupal shells may be seen protruding from the trunk and main branches of a single tree at the end of its period of flight. Females were collected at all hours from noon to 5 P.M. depositing ova. A female will often distribute from 10 to 15 ova on the same tree. There is nothing unusual in its time of emergence. On bright, warm days *acerni* may be found emerging from 8 to 11 A.M. The males, after their wings are developed, which, however, takes more than a few minutes, as stated above, soon fly in search of mates. The females mostly remain on the trunks of the trees till after copulation. On cloudy days very few emerge, and these may be found resting on the trees; none were seen flying on such days.

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## New North American Species of *Scoparia* Haworth.

BY HARRISON G. DYAR, Washington, D. C.

### *Scoparia normalis* n. sp.

♀ Expanse 26 mm. Pale grey; a black shade at base of fore wings; t. a. line dark, slightly bent at middle, thickened on costal two-thirds by a broad black bar which absorbs orbicular and claviform; reniform fused to costa by a black shade, formed of two superposed confluent ellipses, partly filled with black; t. p. line pale, narrowly black shaded within, bent outward slightly beyond reniform; terminal space irregularly black

shaded, the shades succeeding the t. p. line on costa and inner margin and on center of outer margin; a row of black terminal points; fringe dark gray with white dashes at the ends of the veins. Hind wings soiled whitish, darkest along outer margin.

It resembles the ♂ of *centuriella* Schiff., but is very different from the ♀ of that species.

One ♀ Beulah, New Mexico, 8000 feet (T. D. A. Cockerell).  
U. S. National Museum, type No. 7654.

**Scoparia fernaldalis** n. sp.

♂ ♀ expanse 14-18 mm. Very similar to *basalis* Walk. (*libella* Grt.), but rather larger, seemingly somewhat narrower winged and generally darker in color. The markings are the same, varying considerably as in *basalis*. It is perhaps a western form of *basalis*, which I take pleasure in dedicating to Professor C. H. Fernald, who examined a specimen and thought it worthy of separation from the eastern species.

188 specimens, Kaslo, B. C., Canada, 1700 feet. (Currie, Caudell, Cockle and Dyar.)

U. S. National Museum, type No. 7655.

**Scoparia tricoloralis** n. sp.

♂ ♀ expanse 19-21 mm. Light gray, shaded with black; a black patch at base of fore wing on costa; t. a. line pale, slightly oblique, bent a little at the middle, followed on costal two-thirds by a heavy black band that absorbs the orbicular and claviform; reniform small, of two superposed black spots, followed by a large, contrasted, brown cloud; t. p. line narrow, white, narrowly dark edged within, roundedly, evenly and strongly bent outward beyond the reniform; terminal space heavily black shaded, cut outwardly centrally by a diffuse pale arc, representing the subterminal line. Fringe pale, black checkered at base. Hind wings blackish shaded, subpellucid along internal margin.

Four specimens, Wellington, B. C. (Theo. Bryant), Kaslo, B. C. (Caudell, Currie and Cockle.)

U. S. National Museum, type No. 7656.

**Scoparia cinereomeadia** n. sp.

♂ ♀ expanse 14.5 mm. Pale gray; basal space heavily, but not continuously shaded in black as far as the t. a. line; center of wing clear gray, the outwardly placed reniform composed of two superposed ellipses, clouded and fused to costa by black; t. p. line narrow, pale, crenulate, bent opposite reniform but not forming an arc, black edged within. Terminal space shaded in black, leaving a pale space below apex and above anal angle; terminal black spots diffuse; fringe white with a dark basal line. Hind wings grayish, subpellucid.

Two specimens, New Brighton, Pa. (H. D. Merrick.)

U. S. National Museum, type No. 7657.

## Notes on *Culex nigrutilus*.

BY D. W. COQUILLET.

In the autumn of 1902 specimens of a small *Culex* were received from Prof. J. B. Smith, with the statement that they were bred from larvæ living in the salt marshes of New Jersey; they agreed so well with the published descriptions of *Culex nigrutilus* Zetterstedt that they were referred to that species. The recent appearance of the third volume of Theobald's Monograph of the Culicidæ, however, has thrown a grave doubt upon the correctness of this reference, since the figure which he gives of the male clasper on page 201 is very different from the same organ in our species. In the second volume of the Monograph, upon which the identification of our species was chiefly based, no mention was made of the male claspers, but in the remarks on this species near the bottom of page 141 occurs this statement: "I can detect no difference in the  $\delta$  ungues or any important structural detail from *C. pipiens*," thus implying that the claspers are like those of the latter species, figured on page 134.

Prof. Smith assures me that repeated searching by himself and his assistants has failed to discover larvæ of our species in fresh water, it being essentially a salt-water species. Mr. Theobald tells us that the specimens of *nigrutilus* treated of in the second volume of his Monograph were collected by himself "in great numbers in and over half-filled water-butts"—presumably of fresh water. The specimens upon which Zetterstedt founded his original description were from Quickjock, in the northwestern part of Sweden, within the Arctic Circle and over one hundred miles from salt water.

Thus all the facts indicate that *nigrutilus* is a fresh-water species distinct from our salt-water form; the latter will, therefore, require a new name, for which *Culex salinarius* is proposed. The male is so similar to *pipiens* that, as yet, I am unable to point out any distinguishing character; the first joint of the claspers bears beyond the middle of the inner side an irregular row of about five chiefly flattened spines, while near the outer end of this row is an elongate-oval lamella.

The female is also remarkably like *pipiens*, but the cross-bands of yellowish scales on the abdomen are narrower, being scarcely apparent on the anterior segments.

The larva has been well figured by Dr. H. G. Dyar (Jour. N. Y. Ent. Soc., XI, Plate II, Figure 3); strangely enough, it has not a rounded head and robust subanal tube, as in *pipiens*, but a subquadrate head and long, slender subanal tube, as in *territans*, from which it can scarcely be distinguished except that the spinous processes on the subanal tube have three or four branches, while in *territans* they usually have a single branch.

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H. G. KLAGES has disposed of his foreign collection to the Carnegie Museum, and is about to sell his North American material and give up entomology.

ANDRENINÆ (*Andrena* s. l. etc.) and *Parnopes* of North America; Philanthidæ of New Mexico and bees of the Northwest (Oregon, Washington and Vancouver); all these are being arranged systematically. Persons having specimens in these groups from the territory mentioned will add to the completeness of the work by sending their material to the writer for examination.—HENRY L. VIERECK, Connecticut Agricultural Experiment Station, New Haven, Conn.

IN THE December issue of ENTOMOLOGICAL NEWS we note with interest that "the immediate immersion of insects in gasoline in collecting" was suggested, "as they frequently injure themselves in fluttering about the collecting bottle."

How delightfully ridiculous it is that the amateur collector will go on year in and year out stuffing his sphingids and large "flies" into some sort of a death-trap poison-chamber, and cheerfully acknowledging that the specimens are "only slightly rubbed!" He knows that he must never touch these wing surfaces with his fingers, yet he persists in thrusting violently active specimens into the death chamber, knowing full well that the "dust" will fly from said wings till the last struggle is over. He knows, too, that it is no easy task to paper the remains of said specimens when extricated from said slaughterhouse; and the fact that the specimen may come to life if removed too soon is frequently too obvious.

Gasoline injection,—the only simple, safe, and sure method of killing large insects—has been described once or twice in the NEWS; but the amateur, plodding collector would not mend his ways even if extra editions of warning notices were placarded all around him.

Verily, we shall have the needlessly "slightly rubbed" specimens with us forever.—O. W. BARRETT, Mayaguez, P. R.

# ENTOMOLOGICAL NEWS.

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[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

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**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

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PHILADELPHIA, PA., FEBRUARY, 1904.

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It is a trite saying that there are always two sides to a story. Prof. Cockerell has called attention to errors in regard to South-western Geographical names, and his article is timely, but it also calls attention to an unfortunate condition of affairs. Everyone has not been in the Southwest, and everyone does not have a Spanish dictionary at his elbow. If we were to see the words *Arroga near San Ignacio, at light*, we might suspect what was meant, but would not blame the person who did not.

It would be much better when one means to refer to Lower California to use that name and not Baja California.

We are constantly having trouble in deciphering and translating names of places from which collections have been received. The celebrated collector Mr. Jones has been in New Mexico or Old Mexico. He has collected at some celebrated town, not mentioned on any map, and consisting of one street of mud-houses. Mr. Jones of course knows where Mr. Jones has been, and if the world does not know this also, it is the fault of the world. He *writes* his labels but of course no one can read them. Another collector has visited Tuxpan and admits it, for which we feel very grateful, and look in the geography for the place and find four of them—there is nothing like being liberal. We only know things by comparison, and probably would not appreciate an honest man if there were no thieves, so when a collector goes West (or any other direction) and on his return sends you printed labels for the speci-

mens collected, you should be profoundly grateful, and as our school-boy reports say, "may he continue to deserve commendation."

Printed labels are very inexpensive and save endless bother, but if you can't get them printed, write the names of all small and doubtful places legibly.

We have analogous trouble with the names and addresses of people. Mr. *Blank* was born in Blankville, so his mother told him, and has resided on Blank street ever since that momentous event. Mr. Blank may be a man of parts, or he may not, we never met him; we have never been in Blankville, therefore never saw Blank street, but we are sure that Mr. Blank thinks we have by the way he signs his name and writes his address.

Moral—start the New Year by having printed pin labels for all your specimens and send them to your friends when you make exchanges.

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## Notes and News.

### ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

"AREN'T you glad the Christmas holidays are over?" asked the bachelor. "Glad!" snorted the father of eight, as he thought of all the stockings he had filled. "I guess I am. I'm glad I'm not the head of a family of centipedes."

THE NAME *CIRIS*.—I find that the name *Ciris*, Grote, Pr. Ent. Soc. Phil., 1863, applied to a genus of Noctuidæ, will have to fall because of *Ciris*, Koch, 1850, in Arachnida. The noctuid genus may be called *Xerociris*, n. n., type *Xerociris wilsoni* (Grote). In a recent part of Proc. Ent. Soc., Washington, there is a discussion concerning the circumstances under which it is proper to change a preoccupied name. I think that when the author of the original name is living he should be asked to propose the new term, unless he has shown himself regardless of such matters. At the same time I am not sure it would not be better to form committees to look after these matters in different groups, because I have found that many authors either refuse to do anything or postpone action indefinitely, when their attention is called to homonyms they have published. Would it not be possible to form a committee to examine all the generic names given to American insects with respect to homonymy, and remove from our lists all names found untenable on this account?—T. D. A. COCKERELL.



I ENCLOSE some clippings from an adv. of a "Moth Catcher" which I think are worth copying for the edification of the readers of the NEWS. How humiliated the average collector must feel when he reads that a lot of obscure and unknown persons have succeeded, without any effort on their part, in getting information about insect life, which he, notwithstanding all his study has never suspected! to think that the ichneumons sting fruit instead of caterpillars! It will doubtless be hard for the man who has raised about a million ichneumons from pupæ from which he expected some choice moths, to swallow the new idea, but he must come to it if the great *moth catcher man* says so. And to think of the great discovery that a moth makes the lice on cabbages! Surely some of our "louse specialists" must look into the matter. Now if they can tell us what kind of timber produces wood ticks, and what breed of colts can be got from horse chestnuts, and where to find mare's nests, they will oblige E. J. SMITH, Natick, Mass.

"ARROYO GRAND, CAL., Dec. 30, 1901.

This is to certify that I have used the Haseltine Moth Catchers the past summer and found it to be a perfect success. I caught CODLING MOTHS, the POTATO MOTH or FLY, and the MOTH THAT MAKES THE CABBAGE LOUSE. I had no wormy apples to speak of, although bad in 1900 —THOMAS H. KEOWN."

"RICHLAND, MO., Dec. 9, 1901.

I used one of S. A. Haseltine's Moth Catchers in my cabbage patch. I caught the white moth and kept the green worms out of my cabbage.—MAGGIE A. ELDRIDGE."

"The Ichneumon fly, which is called by the book-learned professors a friendly insect, has been seen by practical orchardists to be the guilty fellow that stings the fruit and gives it the appearance of a pepper box. It destroyed the fruit of Austria and Hungary in Europe, and stung and injured the trees. Some of them were found dead with the stings in the twigs of the trees. Col. A. Harrington of Springfield, Mo., saw this (friendly) insect stinging his fruit, and he got the Moth Catcher and cleared them out and made fine fruit. So this so-called (friend) was seen by an orchardist, A. T. Warner, of Lawrenceville, Ill., stinging his fruit and ruined its commercial value this year, 1902."

SINCE the recent fire in Wicken Sedge, when the growth of about twenty acres of the Fen, the property of Mr. G. H. Verrall, entomologist, of Newmarket, with the rare insects, etc., which find sanctuary there, was destroyed by fire, the Cambridgeshire County Police have been making diligent inquiries as to the cause of the fire, with the result that on Monday four University men from Cambridge called on Mr. Verrall and acknowledged that one of their number caused the fire by accidentally throwing down an unspent match, The sedge adjacent to the spot where it fell quickly caught fire, and, seeing what had been done,

all four of the collegians ran away. They readily acknowledged they acted very foolishly in not staying and attempting to put out the fire, but said they lost their heads. All four undertook to reimburse Mr. Verrall for any loss and expense their action had entailed, and with this understanding Mr. Verrall expressed himself satisfied.—STANDARD, (London), June 17, 1903.

HERBERT H. SMITH has given up entomology and collecting and has sold his collection to the Carnegie Museum, at Pittsburgh, for three thousand dollars.

THE MINER is in receipt from an agricultural bureau, of a neat little portrait, life size, of the cotton boll weevil whose depredations in southern cotton fields bid fair to make the product of the silk-worm cheap in comparison with the "fruit of the loom." The picture represents this enemy of "King Cotton" as a rather ungraceful oblong creature, much out of proportion, with six very crooked legs and a long sword-like beak. A fierce mustache, consisting of one hair, curls sarcastically on either side its mouth, above which the eyes, somewhat resembling shoe buttons, glare defiance at the world at large. The picture has been hung in the Miner's art gallery and the cotton growers of Montana are welcome to inspect it at any time free of charge. The people of Montana cannot fail to be as appreciative of the gift as were the natives of a tropical isle for a consignment of warmingpans once bestowed upon them.—*Butte (Montana) Miner*.

ON PAGE 41 of your January number I notice a note on the distribution of *Catopsilia eubule*. Two Sundays ago I had three young boys at my house to see my collection, and they had with them two females and one male of this species which they had captured in Bridgewater, Mass. Mr. S. F. Denton, of Wellesley, has seen these, and I think he was as much surprised as I that they should have been captured in this State.—ANDREW G. WEEKS, JR.

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## Doings of Societies.

At a meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia, held December 17, 1903, Dr. D. M. Castle, presided, and twelve persons were present. The following gentlemen were elected to serve as officers for the present year: Director, Philip Laurent; Vice Director, H. W. Wenzel; Treasurer, E. T. Cresson; Conservator-Recorder, Henry Skinner; Secretary, Frank Haimbach. Publication Committee, J. H. Ridings, C. W. Johnson.

A meeting of the American Entomological Society was held December 17, 1903, Dr. P. P. Calvert, President, in the chair. Twelve persons were present. The report of the treasurer was read and referred for audit. Reports were read from the Curator, Secretary and Librarian. A letter was read from Mr. J. C. Bradley in regard to the loan of books on certain conditions. The matter was referred to the Executive Committee for examination and report. Mr. Ilg exhibited specimens of *Bembecia marginata* reared from blackberry by Mr. Engle, of Pittsburgh. Mr. Matthews exhibited *Ecpantheria scribonia denudata*, ♀, with a single bar on the hind wing. The following were elected officers for the year 1904:

President, Philip P. Calvert, Ph.D.; Vice-President, H. W. Wenzel; Treasurer, E. T. Cresson; Recording Secretary, Henry Skinner; Corresponding Secretary, Frank Haimbach; Librarian, J. C. Bradley.

Publication Committee, E. T. Cresson, C. Few Seiss, B. H. Smith; Executive Committee, P. Laurent, H. W. Wenzel, Frank Haimbach; Finance Committee, J. W. McAllister, C. S. Welles, D. M. Castle, M.D.

HENRY SKINNER, *Secretary*.

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The January meeting of the Newark [N. J.] Entomological Society was held on January 10th, with President Keller in the chair and seventeen members present.

The resignation of Mr. W. Rienecker was read and accepted.

Mr. Bronson was elected to honorary membership.

Mr. Brehme showed a series (about twenty specimens) of *Pseudohazis eglanterima*, var. *shastænsis*, and Mr. Keller a *Hyparparax venus*, caught in Burnett County, Texas, in May.

Mr. Broadwell reported the capture of *Pseudanophora mora*, October 8th, and *Sabulodes sulphurata*, July 29th, both in Newark.

OTTO BUCHHOLZ, *Secretary*.

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The December meeting of the Newark Entomological Society was held on the 13th with Vice President Stortz in the chair and 11 members present.

Mr. Brehme reported as curator of lepidoptera; he com-

mented upon the small number of specimens in the Society's collection, and made the proposition that if each member would from now till March donate 10 specimens to the collection, he would present the Society with 100 specimens representing 50 species new to the collection; his report and offer were accepted.

Mr. Henry Wormsbacher, of Jersey City, was proposed for membership and unanimously elected.

OTTO BUCHHOLZ, *Secretary*.

At the meeting of the Feldman Collecting Social, held December 6, 1903, at the residence of Mr. H. W. Wenzel, 1523 South 13th Street, Philadelphia, eight members were present.

Mr. Bland exhibited some Coleoptera collected in September around English Creek, N. J. He also showed *Brontes dubius* and *B. debilis*, the former from around Philadelphia, the other from English Creek, N. J., September 11th, thus proving that both are northern species. Other interesting forms were spoken of, including *Conotrachelus leucophæus*, new to the New Jersey district, and *Tachygonus spinipes*, taken on September 23d.

Mr. Hardenberg asked regarding the relationship of insects to Fungi.

Messrs. Wenzel, Hardenberg and Bland believed that the same beetles do not live on more than one species of fungus.

Mr. Daecke exhibited the imago and supposed larva of *Plinx appendiculatus*, from Da Costa, N. J. The larva was beaten from a tree and had been kept alive for fourteen months, being fed with caterpillars. He also exhibited the remains of a mass of unmounted mosquitoes which had been destroyed by a moth larva.

Prof. Smith stated that he had bred *Culex dupreei* from larva taken in two different localities in New Jersey. The larva remains at the bottom of water, its gills being supplied with trachea. Also *Culex squamiger*, a Californian species, had been captured at Westville, and near New Brunswick, N. J.

WILLIAM J. FOX, *Secretary*.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XV.

MARCH, 1904.

No. 3.

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## Notes on the Life History of *Crabhamia Jamaicensis*.

BY GLENN W. HERRICK.

(See Plate VIII.)

In a monograph of the Culicidæ, Vol. i, page 345, Mr. F. V. Theobald describes the female of a new species of *Culex*, which he names *C. jamaicensis*. In Vol. iii, page 244, of the same monograph, he describes the male of the same species but under the new generic name of *Grabhamia*. He says that "this beautiful species has so far only occurred in Jamaica." Furthermore, he expresses the opinion that it is rather uncommon in that island. During the summers of 1902 and 1903, I found this mosquito abundant in the vicinity of Agricultural College, Miss. The habits of the larvæ proved of considerable interest and seemed worth recording.

I first noted the larvæ in an open sewage drain on the College campus in 1901. They attracted my attention by their large size as compared with the larvæ of *C. fatigans* which were so numerous in the same drain. At this time several adults were taken from the weeds and grasses overhanging the ditch. They were submitted to Mr. D. W. Coquillett who immediately recognized them as *Culex jamaicensis*, now *G. jamaicensis*. In the

summer of 1903, I noted scores of large larvæ in a roadside pool near Starkville, Miss. At first sight they appeared to be the larvæ of *Anopheles*, for, apparently, they were in horizontal positions. Never having seen *Anopheles* larvæ so abundant, it seemed worth while to stop and examine them in some detail. Much to my astonishment these larvæ were found to be members of the genus *Culex*, or at least, of some genus closely related to *Culex*. Moreover, the great majority of them were lying apparently horizontal just below the surface film of water. Of these, many adults, both males and females, were reared and they proved to be *G. jamaicensis*. From this time forth many larvæ of this species were found in other rain water pools and abundant opportunity was afforded to observe them. With the one exception of those found in the sewage ditch, I have always found these larvæ in transient rain water pools.

The larvæ are interesting from the position they assume in the water. When the larva rises to the surface it assumes, at first, about the same position as the larva of *Culex*. But after a moment, if left undisturbed, the body, with a slight jerk, floats quickly to an approximately horizontal position with the head on a level with the surface of the water, in which position the mouth brushes are able to skim the surface, as it were. The larva can change quickly and easily from the horizontal to the suspended position. The body instead of lying so nearly horizontal as does that of *Anopheles*, hangs suspended,—like a piece of slack rope,—between the head and respiratory tube, and considerably below the surface of the water. The respiratory tube projects out of the water, at least a third of its length, and points forward when the larva assumes the horizontal position. The thorax is inclined sharply upward so as to bring the head to a horizontal position. Figure I, *n*, is purely diagrammatic but serves to show the position of the larva. At the distance of a few feet, when looking directly down upon the larvæ, they seem to lie in the same position as those of *Anopheles*. The larvæ are splendid swimmers and are constantly swimming along the surface but nearly always in a backward direction.

The anal filaments are much longer and slenderer than those

of *C. fatigans*, reminding one strongly of the anal filaments of *Psorophora ciliata*. Dr. Howard remarks that the anal filaments "may possibly function as gills while the larvæ are very young." In the anal filaments of a young larva of *G. jamaicensis*, the tracheæ are very large and as well developed as in other parts of the body. The two main body tracheæ extend on beyond the respiratory tube throughout the length of the last abdominal segment. Each of these bifurcates and sends a branch to each of two anal filaments. The filaments seem to be set in pairs corresponding to the bifurcated tracheæ. The last abdominal segment with its two main tracheæ and with one anal filament is shown at *b*, Figure I.

The respiratory tube of the larva is much longer than that of *C. fatigans* or *C. pungens*.

The pupa also is much larger than the pupa of *C. pungens*. By observing a large number of pupæ, I found that in mid-summer, the pupal stage lasts almost exactly forty-eight hours.

Mr. Theobald states that the eggs, as noted by Dr. Grabham, are laid singly. Although careful search for the eggs was repeatedly made they could not be found. The larvæ would invariably appear in a pool within twelve hours after the formation of the pool by a rain storm. The conviction was gradually forced upon me that the eggs were deposited in or upon the mud to await the coming of the rain. Such a habit of egg deposition for this species is a matter of circumstantial evidence only, for absolute proofs of it are wanting. Since making the observations on this species, Dr. J. B. Smith has published the results of his experiments with *Culex sollicitans*. In these experiments, Dr. Smith proved, conclusively, that *C. sollicitans* deposits its "eggs singly, in dry mud or moist soil, and that for months they lie thus, ready to hatch when covered by water of a proper temperature." Since the publication of the third volume of Theobald's "Monograph," we find that he has removed *C. sollicitans* to the genus *Grabhamia*, thus showing the close relation of the two species under discussion. Therefore it will not be surprising if the habit of egg deposition of *G. jamaicensis* is similar to that of *C. sollicitans*.

The adult female is a striking mosquito, with heavily scaled

wings. The scales of the wings are black and white and give to the wings a distinctively grayish appearance. The base of the third longitudinal vein, where it meets the cross-veins, has a small but distinct black patch of scales (Fig. I, *d*).

The legs are banded and speckled with yellowish white scales, giving the mosquito a distinctive appearance. The femora of all the legs have a pale band near the apex of each (Fig. I, *f*), and the knees are white. The tibiæ are strikingly speckled with patches of white scales on a background of black scales. The metatarsi have a pale ring at the base of each and a pale band in the middle (Fig. I, *e*). The first two tarsi of the front legs are banded at the bases with white (Fig. I). The others are black. All the tarsi of the hind legs are banded with white.

The abdomen (Fig. I, *m*), also has very characteristic markings. A few yellow scales and long hairs are found on the first segment. Each of the next three segments has a triangular patch of creamy scales on the apical border, those of the third and fourth segments being broken in the middle. The patches on the fifth and sixth segments are divided in the middle thus forming distinct lateral spots.

As Mr. Theobald says, "it is a very distinct species, easily recognized by the black speck on the wing, the curious banding and mottling of the legs and the adornment of the abdomen."

#### EXPLANATION OF PLATE VIII.

- a.* larva.
- b.* last abdominal segment with one anal filament showing the tracheæ.
- c.* tuft of hairs from thorax of larva.
- d.* black patch of scales on wing.
- e.* median band on metatarsus of fore leg
- f.* band on femur.
- h.* pupa.
- m.* abdomen of imago showing markings.
- n.* diagram showing position of larva.

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ANTHIDIUM JUGATORIUM Say.—A study of the description of this bee shows that it is a *Dianthidium*, very close to *D. perpictum* (Ckll.). It will therefore stand as *Dianthidium jugatorium*.—T. D. A. COCKERELL.



## A New *Melanoplus* from New Jersey.

BY JAMES A. G. REHN.

Several times during the past few years while collecting in the pine barren region of New Jersey, the author has taken specimens of a large form of the genus *Melanoplus* which differed considerably from any species known to him. Through the kindness of Prof. A. P. Morse, specimens of this have been compared with the series of the genus in the Scudder collection and nothing of similar character found.

From the localities in which the new species has been taken it would appear that dry scrubby pine land is preferred. It is, apparently, a rather abundant species, as in a few minutes work at the type locality a series of about a dozen was taken.

I take pleasure in dedicating this striking species to my friend Mr. Witmer Stone of the Academy of Natural Sciences. Mr. Stone has made a study of the fauna and flora of the pine barren region, and assisted in collecting all the specimens of this species taken.

### *Melanoplus stonei* n. sp.

Types: ♂ and ♀. Between Harris and White Horse, Burlington Co., New Jersey. August 13, 1902. Collected by Witmer Stone and J. A. G. Rehn. (Acad. Nat. Sci. Phila.)

A member of the *packardii* group and related to *M. packardii* and *fædus*, but distinguished by the smaller size, more compressed and excavated vertex and fastigium, the narrower frontal costa (which also has a distinct stricture below the junction with the fastigium), the smaller furcula, the greater interval between the mesosternal lobes in both sexes, and in the rich and striking coloration.

♂ Size medium; form rather slender. Head with the occiput gently rounded; vertex rather strongly constricted, and with the blunt depressed fastigium very distinctly sulcate; frontal costa sub-equal, slightly and very gradually expanding inferiorly, distinctly compressed at its junction with the fastigium, moderately sulcate at and below the ocellus; eyes reniform, slightly longer than the infra-ocular portion of the genæ; antennæ equal to the head and pronotum in length. Pronotum slightly slightly expanded on the metazona; anterior margin truncate; posterior margin obtuse-angulate with the angle broadly rounded; prozona slightly

longer than the metazona, the latter strongly punctate on the lateral lobes; median carina obsolete on the prozona, distinct but low on the metazona; lateral lobes with the lower margin very obtusely angulate; transverse sulci very distinct; dorsal aspect passing into the lateral lobes without carinæ, but with a distinct shoulder. Tegmina rather narrow, subequal, slightly surpassing the apex of the abdomen, apex rounded. Prosternal spine erect, conical, the apex slightly antrorse. Interval between the mesosternal lobes sub-quadrate, expanding; interval between the metasternal lobes longitudinal, about four times as long as broad. Supra-anal plate with distinct median and lateral sulci; furcula extremely short and strongly divergent; cerci short, with a distinct median constriction, apical portion with the lateral face excavated and deflected internally, apical margin sub-rotundate with a slight inferior shoulder; subgenital plate moderately compressed, the lateral margins very slightly arcuate, the apex posterior to the margin of the plate and developed as a distinct tubercle. Anterior and median femora tumid, the anterior distinctly curved; posterior femora rather slender, but with the genicular regions rather broad.

♀ Size rather large; form rather heavy and robust. Head with the occiput distinctly elevated above the pronotum, rounded; vertex and fastigium rather broad, very shallowly sulcate; frontal costa rather broad, subequal in width, reaching to the clypeus, slightly sulcate at and below the ocellus; eyes sub-reniform, the anterior margin almost straight, but little shorter than the infra-ocular portion of the genæ; antennæ about equal to the head and pronotum in length. Pronotum much as in the male, but the whole structure is more inflated, and the metazona is very slightly shorter than the prozona. Tegmina reaching to, but not exceeding, the valves of the ovipositor. Prosternal spine erect, short, blunt, slightly compressed transversely. Interval between the mesosternal lobes quadrate, slightly longitudinal; interval between the metasternal lobes longitudinal, expanded anteriorly and laterally confined by the curved metasternal lobes. Anterior and median femora not inflated as in the male, rather slender, slightly arcuate; posterior femora a little more robust than the same parts in the male.

General color above bistre, below gamboge yellow. Head mottled bistre and wood brown, the distinct, rather narrow, post-ocular streak shining black; occiput with a dark median area margined laterally by obscure bars of a lighter tint; antennæ dull gamboge yellow. Pronotum above with a broad median longitudinal bar of vandyke brown, somewhat mixed with blackish laterally; lateral margins of the disk of the pronotum with a rather distinct bar of wood brown, which becomes obsolete posteriorly; lateral lobes with the post-ocular streak broad and shining black, occupying slightly more than the superior half of the lobe, the inferior margin of the streak supplied with two ovate white blotches, which are strongly contrasted against the shining black bar; remainder of the lateral lobes broccoli brown, slightly mixed inferiorly with wood

brown. Tegmina bistre, with a few sub-obsolete spots of ecru drab. Pleuræ blackish brown except the metathoracic episternum, which bears a prominent diagonal bar of yellowish-white. Abdomen above tessellate with blackish-brown on a dull ochraceous ground. Anterior and median limbs drab, more or less irregularly infuscate with a darker brown; posterior femora drab above and on the lateral face, the lower and internal aspect gamboge yellow, external face with diagonal blackish bars, which cross the superior face and are distinct and regular on the internal surface,\* genicular arch blackish, with a patch of ecru drab below; posterior tibiæ pale claret brown, the spines black except at the immediate base.

## MEASUREMENTS.

	♂	♀
Length of body . . . . .	22.5 mm.	29. mm.
Length of pronotum . . . . .	5.5 "	9. "
Length of tegmina . . . . .	17. "	20. "
Length of anterior femora . . .	4.8 "	4.1 "
Length of posterior femora . . .	12.2 "	14.2 "
Length of posterior tibiæ . . .	10. "	12.2 "

Specimens have been examined from only the type locality and Atsion, Burlington Co., New Jersey. But one specimen was taken at the latter locality, that on September 2, 1902.

But little variation is exhibited by the series examined, the differences which do exist being wholly in the intensity of the coloration and the separate or confluent character of the bars on the outer face of the posterior femora (*vide supra*).

## A Handsome Species of *Tachysphex* from Arizona. (Hymenoptera.)

BY HENRY L. VIERECK.

### *Tachysphex propinquus* n. sp.

This beautiful wasp is related to *T. ashmeadii* Fox, from which it is easily separated by the very acute pygidial area, the more elaborate silvery ornamentation, color, etc.

\* In some specimens these bars are confluent and inseparable on the external face, but in all the specimens examined the superior and internal faces are distinctly barred. The female type belongs to the form with the form with the external bars confluent.

♀.—Length about 10 mm. *Head*.—Clypeus shining, with small and large punctures separated by irregular spaces, the anterior margin prominent, slightly submarginate in the middle; front with small confluent, imperfect punctures, giving a rugose appearance to the integument, vertex with some small imperfect punctures, largely tessellate; space between the eyes across the summit of the vertex equal to about three-fourths mm.; first joint of flagellum a little more than two-thirds the length of the second; impressed space back of the posterior ocelli heart shaped or nearly, shining and with a central longitudinal depression.

*Thorax*.—Sculpture much like that of the front, with a shallow impression medially extending from the interior margin to somewhat beyond the middle; scutellum convex, slightly impressed medially, more distinctly and sparsely punctured than the dorsulum, shining; post scutellum dull; metathorax finely, uniformly coriaceous; posterior face with fine transverse striæ and a longitudinal, nearly almond-shaped impression with point down; mesopleura more finely sculptured than disc of metathorax; anterior tarsi with about fifteen bristles to the comb; middle tarsi with eight spines or more on the first joint between base and apex; posterior tarsi with only one or two spines on the first joint between base and apex (by first joint is meant the metatarsus); length of radial nervure between the stigma and first transverse cubitus about equal to the distance between the first and second transverse cubiti on the radius, length of radius between the second and third transverse cubiti about two-thirds the length of the preceding segment.

*Abdomen*.—Five mm. long; dullish, very finely sculptured; pygidial area shining, slightly convex, a few punctures on the sides, bounded laterally by a sharp raised margin.

Predominating color dark ferruginous; the head is black except clypeus, basal half of mandibles, scape and first three joints of flagellum, which are rather smoky ferruginous, the pedicellum and joints of the flagellum beyond the third are blackish, face with a more brilliant and dense silvery appressed pubescence than rest of head, dorsulum largely black, the reddish color almost obscured, clothed with silver pubescence like the head, but not so dense except on the sides; a spot on scutellum, a spot on metanotum and a small patch on mesopleura blackish, appressed pubescence on these parts not so heavy as on the face, more abundant on the sides than on the dorsum; a broad satiny border of appressed pubescence on segments one to four, notched on each side basally; wings hyaline, nervures dark brown or black; legs sericeous of the same hue as the abdomen, pulvilli and large spur of four posterior tibiæ black.

Type, property of Academy of Natural Sciences, Philadelphia.

Type locality, Florence, Arizona. One specimen taken 23 July, 1903, by Mr. C. R. Biederman.

## Micro-Lepidoptera—Suggestions.

BY W. D. KEARFOTT.

### *Part I.—Pinning and Setting.*

Micro-Lepidoptera in North America are in for a boom, if one dozen letters from new correspondents within the past thirty days, asking for directions of all sorts regarding setting, collecting and breeding can be placed in evidence; and as it would be impossible to do justice to each separately, the Editors of our popular NEWS have offered their pages.

These suggestions make no attempt to illustrate all the ways that each thing can be done, but only an effort to describe in a simple manner that can readily be followed by any boy or girl, at little expense, the methods and apparatus that I have used for the past five years, during which time I have collected, bred or received and mounted over twenty thousand specimens.

One of the most important things to get over is the fear most of us have that because an insect is very small we will certainly spoil it. This will surely be the result if we do not bear in mind that a small body contains but little moisture and will dry out and become stiff in a few hours on a summer day, unless a tight metal (zinc is best) collecting box is used, in which the cork can be moistened once in a while; and also that a setting board with a half-inch slot is not suited for spreading an insect that expands but little more.

Also remember that practice makes perfect, and do not be discouraged if the first or second or third attempt results in fairly good studies of venation but more or less poor cabinet specimens; persevere, and in the fourth or fifth or tenth attempt we will want to call in all the family to see how skillful we are becoming.

PINS.—I use only two sizes, the larger, English, made by Kirby, and known as No. 1 Steel, needle-pointed, black japanned. These are very thin and remarkably stiff, made of spring steel; the head and point can almost be bent together and when released will spring back perfectly straight. The head of this pin is pressed out of the same wire of which the

pin is made, just like a common household white pin, and never comes off.

The smaller ones are German made, and known as Minutien Nadeln; they are very fine, also steel, black-japanned and needle-pointed, length about half an inch; their use involves a double mount, which will be referred to later.

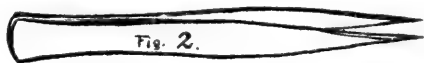
Avoid as a pestilence any pin, white, black or gold, that is part or all brass. Verdigris will surely result sooner or later. Also avoid steel pins with heads made of a different metal squeezed on. These heads will come off at most inopportune times, and the resultant spring of the pin will send the wings and abdomen in every direction.

Don't permit the dealer to sell what he has in stock, but insist on the right sort and he will be forced to get a supply of them.

**PINNING.**—Half the work of good setting is the way the pin is put through the thorax. It should rake well forward and the point should enter as nearly as possible the exact center of the thorax, and if the proper angle is observed it will come out on the under side through the posterior edge of the last thoracic segment, and thus be clear of and prevent damage to the legs; as shown in Fig. 1.



Never lift a specimen with your fingers, at any stage of its progress from the net to your cabinet. Always have at hand a small pair of fine-pointed forceps; the kind jewelers use are



the best, about 4 inches long, cost about 15 cents; and whenever a specimen has to be moved (before the pin is in it) use these fine forceps, catching hold by a leg, never by the wing.

It requires a little practice and patience to pin properly. I usually lift the insect carefully by one leg and lay it in the crevice formed by holding the forefinger of my left hand against the thumb, always with the head of the insect pointing toward me. Then, with the same forceps in right hand, pick up a Minutien Nadeln, being sure to have the point in the right

direction, and push through thorax until you can feel the point, then holding top of pin by forceps, push the insect to desired height, by sticking pin in a piece of soft pith, that of common elder, *Sambucus canadensis* L., being the most satisfactory.



The same procedure if Kirby No. 1 pin is used, except the forceps for handling pin are unnecessary. Fig. 3.

In connection with this operation, two small points will be useful to observe. 1st: if the ends of the forefinger and thumb are very dry, the insect is liable to slip about and dodge the pin. To overcome this, dampen end of finger, rubbing it against thumb until you can feel the least bit of a sticky feeling. The second point: when pinning the insect, steady both hands by letting the tips of the two little fingers press against each other.

**SETTING NEEDLES.**—Nothing better than common fine cambric needles, a package costing only a few cents, stuck eye end into extra long match sticks. This is easily done by holding needle in left hand, vertically, with point on piece of hard wood,—desk-top, for instance,—in the right hand hold the match stick and firmly and gently force it down, so that the eye of the needle goes up into the stick for three-quarters of its length. The match wood being so much softer than the



top of desk, the point goes into the latter only a very little and comes out easily. A few needles will be broken, but with care the majority will be all right. Afterwards with a sharp knife whittle off needle end of stick to a neat taper. Fig. 4.

**SETTING BOARDS.**—Use exactly the same kind as you do for macros, but make the slot just a trifle larger than the bodies of the insects. The widths of slots of my boards range from one-sixteenth to five-sixteenths of an inch; the two sizes most commonly used have one-eighth and one-quarter inch slots.

As the pins I use will not go through thick cork without dangerous forcing, I glue a strip of elder pith on the under

side of the slot; if pith cannot readily be procured, very thin sheet cork (1-32 inch) can be used. This must be of the very best quality AAA, free from knots and holes. My boards are thirteen inches long and are made from one-quarter inch thick well seasoned white pine, of the quality known as pattern lumber. A dozen boards of this length can be made by any boy in half a day. He should first go to a carpenter shop and have this list of sticks cut out by the carpenter and smoothly planed all over.

8 strips,	$\frac{1}{4}$ in. thick,	$\frac{1}{2}$ in. wide,	13 in. long	(tops).
4 "	$\frac{1}{4}$ "	$1\frac{1}{8}$ "	13 "	(bottoms).
8 "	$\frac{1}{4}$ "	$\frac{3}{4}$ "	13 "	(tops).
4 "	$\frac{1}{4}$ "	$1\frac{3}{4}$ "	13 "	(bottoms).
8 "	$\frac{1}{4}$ "	1 "	13 "	(tops).
4 "	$\frac{1}{4}$ "	$2\frac{3}{8}$ "	13 "	(bottoms).

In addition get about six feet in length of the same boards,  $\frac{1}{4}$  inch thick,  $\frac{7}{8}$  inch wide, but sawed *cross-grain*. The above is sufficient for twelve boards of three different sizes. Enough for a beginning.

To put these together, clear the desk or table of all other objects, separate the different size sticks into piles, have the cork cut into half inch wide strips—or if you can get pith have it ready, one side cut flat, take a razor or extra sharp knife to cut this, and have your glue pot in working order.

Start first and glue the cork to the bottom side of the top strips by laying two of equal width together and carefully separating them exactly equally their whole length one-sixteenth, one-eighth, or whatever width the slot is to be. Then hold the strip of cork in one hand, and with the brush touch both edges of one side lightly with thin glue (this must be done quickly); then lay glued side down on strips, carefully pressing, but avoid getting any glue into slot or on the center of cork that goes under slot.

Very carefully push this pair of tops to far side of table, out of the way, placing a book on them to insure drying firmly and evenly. Continue this operation until all twelve pairs of tops have cork glued under them, and then prepare the bottom boards by attaching the end and side pieces or uprights. These



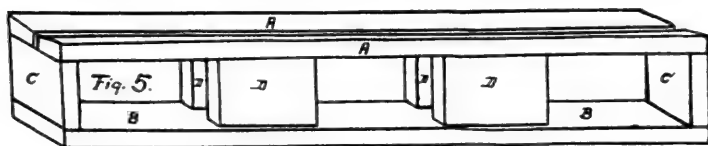
latter are made from the cross-grain strips, and can easily be split with a pen-knife into proper lengths, which for the end pieces must be the same as the width of the bottom boards. I use two uprights on each side of my thirteen-inch boards, about an inch wide, to give stiffness and prevent springing of the completed board.

Now with the glue brush put a liberal quantity of glue on one end only of each end and side piece, placing them in their respective positions on the bottom board. As soon as this is done, repeat the dose of glue on the top ends of these pieces, and carefully lift the first corked pair of top boards, which will be rigid enough by this time to handle gently, on top of the uprights; then move to a permanent drying place, with books or weights on top. Finish up the other eleven in the same way, and leave two days to thoroughly dry.

The boards are complete now, but perfectly flat on top, which is objectionable, and must be remedied by running a small plane a few times over the surfaces, taking the deepest cuts on the inside. The wood is so soft and easily worked that this is much simpler than it seems. I use a little steel and iron plane one and a half inches wide that cost about 40 cents.

Be very careful to see that the inside edges, which are now the upper edges of the slot, are perfectly even and level to each other. If slightly irregular, the final finish with very fine grade sandpaper will make them even.

Fig. 5 shows an outline of a finished board and position of the several parts, except the cork, which is hidden by the top boards.



A, top boards. B, bottom boards. C, end uprights. D, side uprights.

There are several ways of expanding specimens practiced by our well-known collectors, and attention and practice with

any system will insure good results. The advantage I find in the following is simplicity and rapidity ; I can usually average from forty to fifty specimens per hour.

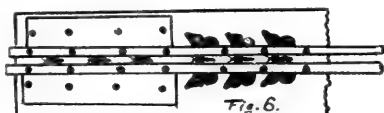
Have a goodly number of strips of paper ready ; these should vary in width from one-sixteenth to three-eighths or half an inch, and an inch longer than the boards. The best paper is heavy book linen ; a visit to any bookbinder or printer will find a mine of suitable strips around his trimming machine, and if he is not too busy he will put a thick layer of these scraps in the machine and shear them off in different widths. All of which will save the trouble of cutting them out with scissors and insure their edges being parallel to each other. A supply of setting pins is also required, and the best I know of are the cheap black glass-headed steel mourning pins, " Made in Germany." Thirty or thirty-five cents will buy a dozen small boxes or about five hundred.

SETTING. — With setting board in front, several setting needles handy, setting pins alongside, relaxing box on left side, and fine-pointed forceps within reach, we are ready to begin.

First select two of the narrowest strips of paper, pinning one end of each firmly into upper end of board, close to but not overlapping the slot ; then with forceps take a specimen from box, quickly pin it in the slot at the top of board, with pin nearly vertical, just a little inclined forward ; with needle raise the wings until they rest flat on each side, then bring the two paper strips down over the wings ; in this position hold left thumb or forefinger on the strips, an inch or two below the moth, and with the setting needle in right hand, first draw one pair and then the other pair of wings into a position so that the hind margin of forewings makes a straight line ; after getting each pair of wings in position, stick a pin through the strip just below and close to the moth. Continue repeating this until your board is full, and then pin on each side a wider strip of paper, to cover entirely the projecting ends of the wings. Sometimes this last process cannot wait until entire board is finished, as some specimens are more inclined to curl than others, and if the wings show the slightest tendency to

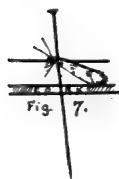
rise up, then use short outside strips for each half dozen, more or less, as may be necessary.

Fig. 6 shows upper end of board, with the inside narrow strips in position and pinned down over six moths, and a short outside strip covering the first three moths. The large black dots are the pins.



Moths die usually in one of the following three positions, and the manipulation is different for each, but all are easily handled if treated tenderly.

First, with wings down against their sides, hiding feet. It requires a little care to pin specimens in this position, but if the moth is soft or properly relaxed, it is the easiest to spread. Supposing that the pin has been inserted so that it angles forward (Fig. 1), it must be put in the board so that it is nearly vertical to the surface of the board (Fig. 7); this makes moth with head slightly higher than abdomen; run the setting needle



under one pair of wings and, with a quick jerk, raise it, and the wings will be found to be in almost the correct position on the board.

Second, with wings elevated on both sides, entirely hiding the upper surfaces (Fig. 8). To set one in this position, pin as before and, holding the inner strip between second and third fingers of left hand just high enough to clear wings, with the setting needles gently press on the bases of the wings, and as they go down toward the board bring the paper strip down, and very quickly they are in position.



Third, with wings drawn close to body, sometimes almost rolled around it. This is the hardest position, but should be treated the same as the first; in fact, it is well in both of these positions to attempt to draw out the wings before the pin is all the way down, being careful to use the setting needle on the

under side, as a lifter, as much as possible, avoiding using the needle on the upper surfaces except to lightly bring into the final position.

DOUBLE MOUNTS.—Fig. 9 shows a double mount complete. To prepare the little strips, take a sheet of  $\frac{1}{8}$ -inch AAA cork, and with parlor paste stick a sheet of good quality white paper on one side only, and place between two books or in a letter-press for a few hours to dry smoothly and evenly. Then,



with a very sharp knife, cut the sheet into strips about an eighth of an inch wide; then cut these strips into short lengths, three-eighths to three-quarters of an inch long. Stick a No. 6 pin through one end of each, with the white paper side up. Have plenty of these mounts on hand, and as you remove your specimens from the setting boards, those that are pinned with Minutien Nadeln can be

immediately pinned on the double mount, and as soon as locality label is placed on the big pin, as shown on figure, are ready for the cabinet.

The locality labels are nearly of as much importance as the insect, and a collection with every specimen bearing label showing place and date of capture is worth about ten times as much cash value as the same collection with the labels absent.

My labels are printed with locality on top line, my name on second line, and a blank space left below the name for the date. I strongly urge all collectors to have their names on the label. It adds much to the interest in the specimens, and, as is often the case, if the species is new, whoever describes it can give credit to its actual discoverer. In dating labels don't use figures for indicating the month. Either write it in full if short-name month, or abbreviate if too long to write in full, or use the Roman letters, *i. e.*, vi, 26 equals June 26th or, if your preference is to put the day first, 26, vi. It will always be understood.

(To be continued.)

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MOTHER POTATO BUG—"Run, children! get under this toadstool! We are going to have a shower of paris green!"

## Notes on the Life History of *Chrysophanus Gorgon*.

By J. G. GRUNDEL, Alma, Santa Clara Co., Cal.

The female *Chrysophanus gorgon* deposits eggs in the forks of a long-stemmed species of *Eriogonum*, a plant which only grows on the very dry hillsides.

Only one egg is laid in a given fork, but others repeat the act until as many as five or six are found in one place.

The eggs are deposited in June, and the young larvæ emerge in or about the latter part of August, and make their way to the lower part of the plant and hide among the old leaves feeding but very little and only on the upper or green side of the leaf, which the larva resembles in color, being of a dark green.

The larvæ feed only during the night and early morning up to about 9 o'clock, A. M., growing but very slowly, being only one-eighth of an inch long by the latter part of October.

After several moultings the appearance of the larvæ changes to a furry light green, nearly white and exactly resembling the under side of the leaves upon which only it feeds and on which it also fastens its cocoons, becoming full fed about May 1st, a year from the time the eggs were laid, and when full grown one-half inch long, with body thick at middle and tapering to both ends; head very small and hardly to be seen, even when feeding, and appears to be lifeless when removed from the plant and remains so for several hours.

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## Two New *Halictus* from New Jersey.

By J. C. CRAWFORD, JR.

***Halictus vierecki*** n. sp. ♀.—Head and thorax brassy-green, closely covered with appressed golden-yellowish pubescence, the metathorax contrasting because bare on disk, at times more greenish; pubescence below antennæ lighter colored; facial quadrangle slightly longer than wide; face closely and rather coarsely punctate, the basal half of clypeus more coarsely so, the apical half smooth, shiny, rufous; labrum and mandibles rufous; flagellum beneath dull ferruginous; mesothorax closely, finely punctate; legs dark, honey-colored, femora medially brown; inner hind spur with about four long teeth; tegulæ testaceous, pubescent, wings yellowish, splendidly iridescent, nervures and stigma testaceous; base of metathorax enclosed, finely tessellated and finely, irregularly rugose to apex; truncation and sides covered with pubes-

cence, sides closely, coarsely punctate; abdomen dark honey-color, where covered with pubescence appearing lighter; broad apical margins of segments pale testaceous; abdomen closely and very minutely punctate, covered, except disks of segments 1 and 2, with appressed yellowish pubescence; very rarely the medial segments stained with blackish; venter slightly darker than above. Length about 4 mm.

♂ unknown.

Type locality: Clementon, N. J.

Fifty specimens from New Jersey, as follows (H. L. Viereck, coll.): Clementon: on trailing blackberry, June 6, 30 ♀; June 2, 2 ♀; on *Rubus villosus*, June 2; also (without flower label) Apr. 17; May 9, 30. Riverton: Apr. 17, 2 ♀; Apr. 23; May 9; on *Solidago*, Aug. 11; on *Monarda punctata*, Aug. 11, 3 ♀. North Woodbury: June 13; on *Helianthemum canadense*, June 13. Shark River: July 7. Farmingdale: July 14. Westville: April 19; July 21. Also, one specimen received from Mr. E. S. G. Titus: East Marsh, D. C., Aug. 18, '03, W. V. Warner.

Dedicated to Mr. H. L. Viereck, from whom I received the excellent New Jersey series.

Differs from the descriptions of any *Halictus* with reddish abdomen and the clypeus anteriorly testaceous in the dense covering of yellowish pubescence, as well as in the following details:

From *creberrimus* in the clypeus greatly produced, antennæ darker beneath; rugæ reaching the apex of metathorax; abdomen without æneous reflection.

From *inconspicuus* in the metathorax not granulose, abdomen not smooth and shiny; size larger.

From *testaceus* in the metathorax closely punctate; abdomen punctate.

From *impurus* in the mesonotum not smooth and polished medially; legs not polished; smaller.

From *nymphalis* in smaller size, finer punctuation of mesonotum, color of abdomen; lighter legs.

*Mesillensis* is said to differ from *nymphalis* only in the bluer color and punctate first abdominal segment; so the differences given for *nymphalis* can be applied to *mesillensis* also.

Of the species given above, only *nymphalis* is known to me. In *creberrimus* and *inconspicuus* the color of the anterior margin of the clypeus is not given, as they are included above.

**Halictus marinus** n. sp. ♀.—Green, inclining to olive, with a very slight brassy reflection, clothed with abundant white pubescence, long and conspicuously plumose on the sides of face, pleura, scutellum, post-scutellum, metathorax, base of first abdominal segment and lateral margins of other segments; head closely and moderately coarsely punctate, facial quadrangle distinctly longer than wide; clypeus with large sparse punctures, apex smooth, purplish-black; antennæ black, the flagellum dull ferruginous beneath; mesothorax finely roughened, finely and closely punctate, scutellum with two smooth spots on disc; mesopleura rather coarsely punctate, metapleura finely roughened; medial and parapsidal grooves apparent but not very distinct; base of metathorax finely, strongly longitudinally rugose to apex, not enclosed, truncation finely roughened, rounded at top; legs dark brown, femora with æneous reflection, pubescence white; inner hind spur with four long teeth, the last rather short; wings hyaline, splendidly iridescent, nervures and stigma very light honey color; tegulæ dark, pubescent, very large and pointed behind as in *regularis*, punctate all over; abdomen finely transversely lineolate, finely, sparsely punctate, the first segment with finer, very sparse subobsolete punctures; apical margins of segments 1-2 rather narrowly testaceous, of 3-4 broadly testaceo-hyaline; all abdomen, except disks of segments 1 and 2, rather thinly covered with whitish plumose, sub-appressed pubescence, more abundant toward apex; venter dark, apical margins of segments lighter. Length 6-7 mm.

♂ unknown.

Four specimens from Ocean City, N. J., June 19, '01 (Viereck, coll.)

"Swept from grass *Scirpus*, *Ammophila*, etc., growing along the strand just within the beach, and constituting the first zone of plant life from the ocean—maybe they they were flying up from their nests in the sand." (Viereck in litt.)

Received from Mr. H. L. Viereck, who remarked: "Allied to *pilosus* Sm., but distinct by whitish pubescence and larger, less crowded punctures on dorsulum." It is also distinguished by the tegulæ, which place it in the *regularis* group, but the large size easily separates it from those species. *Nymphæarum* also has the tegulæ punctate, but they are rounded behind; the metathorax is very coarsely rugose, and the abdomen black, easily separating it from *marinus*.

## North Carolina Records of Odonata in 1903.

BY C. S. BRIMLEY and F. SHERMAN, JR.

During 1903 we have collected nineteen species of Odonata not previously recorded from North Carolina, besides which we have received records of two others from other parties. Additional localities for species already recorded\* have also been secured.

The collecting was done by the two authors and by Mr. S. W. Foster, who was Mr. Sherman's assistant during the summer. Thanks are due to Mr. R. P. Currie, U. S. National Museum, and Dr. P. P. Calvert, Academy of Natural Sciences, Philadelphia, for the identification of specimens.

In the following list an \* before the name of a species denotes that the species has not been previously recorded from North Carolina; a B, S, or F after a record means that the species was taken by Brimley, Sherman, or Foster, as the case may be.

**Gomphus exilis** Selys; Lumberton, April 7, nine specimens (S & B).

**Gomphus parvulus** Selys; Lumberton, April 7, three specimens (S & B).

**Gomphæschna furcillata** Say; Raleigh, March 24, one female (S); April 3, two males (B); April 9, four males (B); July 8, one male (S); the last specimen was caught in a house.

\* **Basiaeschna janata** Say; Southern Pines, March 28, one male (S); Lumberton, April 7, two males (B).

**Nasiaeschna pentacantha** Rambur; Washington, N. C., July 16, one male (S).

**Epiæschna heros** Fabr.; Cape Hatteras, April 6, one female, H. H. Brimley.

**Anax junius** Drury; Beaufort, N. C., June 15, 18 (S).

**Æschna** (sp.); Raleigh, N. C., one specimen with broken appendages, October 16 (F). A number of good-sized *Æschnas* were seen on the wing during October and November (B), apparently not *A. junius* or *E. heros*.

**Cordulegaster maculatus** Selys; Raleigh, April 13, male and female (B).

**Didymops transversa** Say; Raleigh, March 31, one male (B); Lumberton, April 7, common (S & B).

**Tetragoneuria cynosura** Say; Lumberton, April 7 (S & B).

**Tetragoneuria semiaquea** Burm.; Lumberton, April 7 (S & B).

**Tetragoneuria complanata** Rambur; Lumberton, April 7, six specimens (S & B).

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\* See ENT. NEWS, vol. xiv, pp. 150-157, May, 1903.



- \* **Helocordulia selysi** Hagen ; Southern Pines, March 28, one male (S) ; Lumberton, April 7, one male and two females (S & B). The spotting on the antenodals is much heavier in the two males than in the two females.
- Perithemis domitia** Drury ; Fayetteville, July 10 (F).
- Pachydiplax longipennis** Burm. ; Lumberton, July 3 (S) ; Washington, N. C. July 16 (S) ; Beaufort, N. C., June 11, 13 (S).
- Mesothemis simplicicollis** Say ; Washington, N. C., July 16 (S).
- Libellula cyanea** Fabr. ; Fayetteville, July 10 (F) ; Weldon, July 15 (F).
- Libellula axillena** Westw. ; Beaufort, N. C., June 9, 11, 18 (S).
- Libellula incesta** Hagen ; Washington, N. C., common (S) ; Raleigh, fairly common in May, June, July and August (B).
- Libellula flavida** Ramb. (**plumbea** Uhler) ; Raleigh, July 7, one male ; August 25, two males (B).
- \* **Libellula auripennis** Burm. ; Beaufort, N. C., June 9, 11, 18, five specimens (S) ; Washington, N. C., one male (S).
- \* **Libellula exusta** Say ; there is a specimen in the entomological collections of Cornell University from North Carolina, but without date or locality (S).
- \* **Micrathyrta berenice** Drury ; Beaufort, N. C., June 4, 20, 24, thirteen specimens (S).
- \* **Pantalla flavescens** Fabr. ; Raleigh, July 22, one seen ; August 10, one male taken in Green's rock quarry (B).
- \* **Tramea carolina** L. ; Lumberton, April 7, two males (S & B).
- \* **Calopteryx amata** Hagen ; two specimens in the entomological collections of Ohio State University, collected at Magnetic City, N. C., by Prof. W. C. Wetherby. (Prof. J. S. Hine in letter.) (B).
- \* **Calopteryx dimidiata** Burm. ; Lumberton, April 7, three specimens (S).
- \* **Lestes inaequalis** Walsh ; Raleigh, May 28, June 4, 10, 13, seven specimens (B).
- \* **Lestes disjunctus** Selys ; Raleigh, July 15, one male (B).
- \* **Lestes forcipatus** Rambur ; Lumberton, April 7 (S & B) ; Raleigh, March 31 to August 10 ; all taken later than April were in Green's rock quarry (S & B) ; Lumberton, July 3 (S).
- Lestes rectangularis** Say ; Weldon, July 15 (F).
- Argia putrida** Hagen ; Fayetteville, July 10 (F).
- Argia tibialis** Rambur ; Fayetteville, July 10 (F). Several females from Raleigh and one from Fayetteville have the thorax with blue markings (B).
- \* **Argia fumipennis** Burm. ; Lumberton, July 3, three specimens (S).
- Argia bipunctulata** Hagen ; Raleigh, May 28, 30, July 8, 9, 15, 16 ; taken only along very small, somewhat marshy streams (S & B).
- Erythromma conditum** Hagen ; Raleigh, common March, April, May ; frequently seen resting with half-spread wings like a *Lestes* (B).
- Anomalagrion hastatum** Say ; Raleigh, April to September, commoner late in the season (B).

- Nehalennia posita** Hagen ; Raleigh, April to September, common throughout the season (B).
- Ischnura ramburi** Selys ; Raleigh, May 27, June 8, in Green's rock quarry, July 18, one male on Walnut Creek (B) ; Washington, N. C., July 16 (S).
- \* **Ischnura verticalis** Say ; Raleigh, April 3, three females (B).
- \* **Enallagma doubledayi** Selys ; Raleigh, common from May to August in Green's rock quarry (B).
- \* **Enallagma civile** Hagen ; Raleigh, May 21, July 16, two males in Green's rock quarry (B).
- \* **Enallagma aspersum** Hagen ; Raleigh, common from May to August in Green's rock quarry (B).
- \* **Enallagma traviatum** Selys : Raleigh, June 8, July 16, two males in Green's rock quarry (B).
- \* **Enallagma divagans** Selys : Raleigh, May 16 to 28, around pools near Walnut Creek (B) ; Lumberton, April 7, one (S & B).
- \* **Enallagma exsulans** Hagen ; Raleigh, July 23, three males, on Neuse River, at Poole's (B).
- \* **Enallagma signatum** Hagen ; Raleigh, May 19, 21, August 5, five specimens in Green's rock quarry (B).
- \* **Telagrion dæcki** Calvert ; Raleigh, June 10, 13, 20, about 130 specimens in all taken ; all were along the edges of the same large marsh ; the females stayed mainly in the thickets a little distance from the marsh (B).

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### SPECIAL NOTICE.

A department for the advertisement of the wants of specialists, particularly those working on the classification of groups of insects.

Announcement : Under this heading and as part of "Notes and News," we wish to place announcements of the doings and wants of the systematist.

Persons wishing to obtain material for the sake of making more perfect classification, or for other work of a comprehensive character, are invited to send a notice of their intentions to this department. It is hoped that through the prominence given the news mentioned, all material in collections will be made available and the chances of duplicating work become remote. It is becoming more and more desirable that systematists should confine their efforts to the treatment of groups of species rather than to miscellaneous single descriptions, especially of species belonging to a group which has not yet been treated in some comprehensive work as a monograph or synopsis.

# ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—Ed.

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PHILADELPHIA, PA., MARCH, 1904.

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We not infrequently have inquiries in regard to the tariff laws in relation to insects. It would appear that there is a duty of ten per cent ad valorem, as they would probably be classed under "raw" articles. Dr. L. O. Howard has very kindly sent us the following tariff regulations, with his comments:

Paragraph 20 of the Tariff of 1897 reads, "Drugs, such as barks, beans, berries, \* \* \* dried insects, grains, gums, \* \* \* etc., one-fourth of one cent per pound and in addition thereto ten per centum ad valorem." I imagine that this paragraph refers to Spanish flies and such things.

Paragraph 666 reads, "Specimens of natural history, botany and mineralogy, when imported for scientific public collections, and not for sale;" this is one of the paragraphs under the free list.

I find no other reference to collections of insects except that Paragraph 548 under the free list includes "drugs, such as barks, beans, berries, \* \* \* dried insects, grains, gums, \* \* \* any of the foregoing which are drugs and are not edible and are in a crude state and not advanced in value or condition by refining and grinding or by other process, and not specially provided for in this Act."

Of course collections not intended for public institutions come under the provisions of Section 6, which reads "That there shall be levied, collected and paid on the importation of all raw or unmanufactured articles, not enumerated or provided for in this act, a duty of ten per centum ad valorem, and on all articles manufactured, in whole or part, not provided for in this Act, a duty of twenty per centum ad valorem."

## Entomological Literature.

DR. HOLLAND'S MOTH BOOK.—Criticism is disarmed at the outset, when the author saddles upon the would-be critic the responsibility for the determinations in his specialty. So the only point I have to call attention to in the Noctuidæ is a failure of my own to recognize an erroneous determination on Plate XXV. Figure 9 should be *ferrealis* instead of *petulca*. The original determination is not mine; the failure to recognize the error in proof is chargeable to me. Having thus acknowledged my sins, I am free to congratulate Dr. Holland on the excellent book that he has produced upon our favorite study and the impulse which it is sure to receive from it. There are some things that I don't like about it; but that is no proof that they are bad. I wish there had been no attempt to print half-tone figures on rough paper; it does not do justice to the block and does not much help the man who tries to identify the picture.

But the main feature to which I object is the complete surrender, in the Sphingidæ, to the doctrine that, where an author proposes a genus and lists a number of species under it without specifying a type, the first specific name on the list must be considered as such, irrespective of what others have done. This is contrary to the code of the American Ornithologists' Union, which has been generally followed by American entomologists, and it results in a complete reversal of the conceptions applied to some of our best-known generic names. I confess that I do not see my way clear to follow Dr. Holland in his acceptance of the Rothschild book; it is upsetting the practice of a century on a technicality that benefits no one, and kills the spirit that abstract justice may be done to the letter. Why should American entomologists discard the canons of a code prepared for the American ornithologists by some of the best systematists of our country? And why should we follow Rothschild rather than Kirby, Staudinger or Latreille? The interests of a stable nomenclature have not been advanced by the adoption of a new dispensation in a popular work.—J. B. SMITH.

THE MICRO-LEPIDOPTERA IN DR. HOLLAND'S MOTH BOOK.—The fifty-four pages of text, in which are forty-eight figures, usually illustrating life histories, and eighty-odd colored figures, will prove of much help to collectors in determining a few of their smaller captures; and is an earnest of what we may look for when Dr. Holland publishes his "Micro Moth Book"—the need of which is very apparent when we consider that more than one-third of all our Lepidoptera are embraced under this heading.

It is to be regretted that the text figures are so very poor, due to too rough paper or worn-out cuts of Riley's—or a combination of both; and that the colors of the figures of the plates are not as clear and natural as could be desired.

The percentage of errors of identification is gratifyingly small. I note the following:

Plate xlviii, Fig. 24, is *Olethreutes nimbatana* Clem., and not *Platynota flavedana* Clem. Fig. 40, same plate, is not *Epagoge tunicana* Wlsm. It is probably *Sparganothis senecionana* Wlsm.; but Dr. Holland is not responsible for this error, as there at least three different species in the Washington, Philadelphia and New York museums, all labelled *tunicana*. I hope to straighten this mix-up very soon.

Same plate, Fig. 22, *Tortrix albicomana* Clem. is very unlike the type which is in Academy of Natural Sciences, Philadelphia, and is a pale yellow insect. The form figured is rather unusual.

*Pyrausta ochosalis*, Fig. 57, plate xlvii, should be credited to Dyar and not Fitch MSS., as the former described this from Fitch's manuscript in a recent issue of the proceedings of the Washington Entomological Society.

Several of the generic names used by Dr. Holland differ from Prof. Fernald's latest published list of Pyralids, for what reason I do not know: *Zinckenia* Zell. for *Hymenia* Hbn.; *Glyphodes* Gn. for *Diaphania* Hbn.; *Phlyctænodes* Gn. for *Loxostege* Hbn.; and he has repeated the error which occurs in both Dyar's Catalog and Smith's 1903 List: *Alceris* in place of *Acleris*.

*Loxostege triumphalis* Grt. possesses a melancholy interest, as it is the last or nearly the last North American species described by Grote. The type is in my collection.

One thing I feel very sorry about in a book that is bound to become so popular with the young collector, and that is the stone wall he has built around the method of expanding and handling these small specimens. Chapter two is principally given up to this subject, and among other impossible things calls for beveled glass slides—How many collectors, young or old, will go to this trouble and expense?—and also advocates the very questionable method of holding the wings down with one or more threads. I do not think one specimen out of fifty will dry flat and retain the larger proportion of its scales if set in the manner advised.—  
W. D. KEARFOOT.

THE general acclamation and praise with which Dr. Holland's long expected Moth book has been received are certainly well deserved, and it seems almost hypercritical in the face of the many excellent features which render the book almost indispensable even to the advanced student, to call attention to any defects. Unfortunately there are a few improperly identified figures which, while of no moment to the specialist, would certainly mislead beginners—the very class for whom the book is intended.

Dr. Dyar has already called attention, in the December issue of the Canadian Entomologist, to several misnamed figures, and I feel it is my duty to point out another, with profound apologies to Dr. Holland.

Figure 1, on Plate VI. is presented as *Cocytius antæus* Dr. ♀. It is

not that species at all, but is an excellent, tho' light colored, figure of *C. cluentius* Cr. ♂. I have a full series of *C. antæus* (*medor*) of both sexes as well as specimens of *rivularis*, *duponchelli*, *beelzebuth* and *cluentius*. For two years I received nearly all of Mr. Barrett's catch of *antæus* from Mexico, handling upwards of 100 specimens. *Antæus* is larger in both sexes and differently shaped in the wings than *cluentius*; is of a gray-green rather than chocolate brown, has a relatively and actually larger clear area in inferior wings; lacks the light brown dash near apex of fore wings, so characteristic of *cluentius*; and as far as my observation goes, *antæus* never has more than three pairs of distinct yellow spots on sides of abdomen, the basal pair being obsolete. *Cluentius* usually has six pairs of abdominal yellow spots, the basal pair being strongly marked. In *antæus* the yellow spots at base of inferior wings are confluent; in *cluentius* a dark dash separates them. The two species are abundantly distinct and contrast strongly when placed side by side, not intergrading like *C. antæus* and *C. antæus medor*. *Duponchelli*, *rivularis* and *beelzebuth* might, by an inexperienced eye, be confused with small specimens of *antæus*, but *cluentius* never. I trust Dr. Holland will pardon my calling attention to this, for I heartily admire the book.—  
ELLISON A. SMYTH, JR., Blacksburg, Va.

ODONATA OF MAINE.—Thanks to the kindness of Prof. Gilman C. Drew, successor of the late Prof. F. L. Harvey at the University of Maine, I have lately received a copy of *The University of Maine Studies No. 4. A Catalogue and Bibliography of the Odonata (Dragonflies) of Maine, with an Annotated List of the Collectors. By Francis Le Roy Harvey, Professor of Natural History. Orono, Maine, August, 1902. 16 pp.* This has been printed from one of those manuscripts which Prof. Harvey placed in my hands,\* but which seemed to me to be more fittingly published by an institution of the State to which its subject-matter specially related. Since this paper may be overlooked by those interested in these insects, it seems worth while to call attention to its existence. The catalogue occupies nine pages, listing 34 genera and 94 species, of which latter 3 are Calopteryginæ, 27 Agrioninæ, 15 Gomphinæ, 4 Cordulegasterinæ, 8 Æschninæ, 18 Cordulinæ, 19 Libellulinæ, and is based on all the known records. The two pages of bibliography cite 22 papers by seven authors, while notes on thirteen "Collectors of Maine Odonates," with the names only of some others, are given on pages 14-16.—PHILIP P. CALVERT.

FIRST KATYDID—Why didn't you come before?

Second Katydid—Were you calling?

Was I calling? Don't you see how hoarse my legs are?—Exchange.

\* See the NEWS, vol. xi, p. 452; vol. xii, p. 178.

## Doings of Societies.

The Tenth Regular Quarterly Meeting of the Pacific Coast Entomological Society was held at the residence of Leon Munier, 1148 Guerrero Street, San Francisco, on the evening of November 14th, President Fuchs in the chair. Seventeen members responded to roll-call. Five visitors were present, and two new members were elected.

Miss Julia Wright read a paper reporting the results of a collecting trip to Towles, Placer Co., exhibiting some sixty specimens of Coleoptera taken. Among the number were: *Omus rugipennis* Van Dyke MS., *Pterostichus inanis*, *Corymbites edwardsii*, *Trachykele lecontei*, *Buprestis gibbsii*, *Chrysobothris nixa*, *Ellochætes leoninus*, *Leptura grossa*, *Dyslobus segnis*.

Dr. E. C. Van Dyke read an account of a short collecting trip to the Lake Tahoe region, giving an interesting account of the habits as far as known of the species of Coleoptera taken, exhibiting his catch, and also many species taken in North Carolina.

Mr. J. G. Grundel reported the life-history of *Chrysophanus gorgon*, exhibiting the pupa and food-plant (*Eriogonum*) of the same. He also stated that the larva of *Thecla augustus* very much resembles the larva of *C. gorgon* in shape, but that the color is pink. He found it feeding upon the flowers and buds of the Yerba Santa (*Eriodyction*) in the latter part of March and early part of April.

Mr. Edw. Ehrhorn reported a collecting trip to the Klamath Hot Springs in August, and also one to Pokagamu in September. Mr. Fuchs identified the following Coleoptera collected by him: *Cychrus obliquus* var. *convergens*, *Deretaphrus oregonensis*, *Cucujus puniceus*, and *Dyslobus segnis*. Mr. Ehrhorn stated that three new species of *Coccidæ* were taken.

Mr. F. W. Nunenmacher exhibited some rare *Coccinellidæ*, such as *Hyperaspis hornii* and *Scymnus myrmidon*.

Mr. Fordyce Grinnell showed a box of Lepidoptera from about Los Angeles, the following being especially noted: *Lasiocampa medusa*, *Anatolmis regulus*, *Nisoniades* sp., *Melitæa wrightii*, and *Colias cæsonia* var.

Mr. J. C. Huguenin drew attention to the following, in a

box that he exhibited: *Limenitis lorquinii* var., *Kodiosoma* sp., *Alypia lunata*, *Pieris sisymbri*, *Pyrameis caryæ* var. *mulleri*.

*Sphinx chersis* was presented by Mr. James Cottle.

Mr. Leon Munier showed a very nicely arranged box of miscellaneous Coleoptera. F. E. BLAISDELL, M.D., Sec.

At the meeting of the Feldman Collecting Social, held January 20th, at the residence of Mr. H. W. Wenzel, 1523 S. 13th St., Philadelphia, twelve persons were present.

This being the annual meeting, the President, Mr. C. R. Baerner, made his address, dealing with matters chiefly of interest to local entomologists.

Prof. Smith spoke on the dissemination of malaria by the mosquito, illustrating his talk with lantern-slides.

Mr. Haimbach exhibited *Chrysophanus hyphophlæus* and *Sabulodes transversata*.

The following officers were elected for 1904: *President*, C. R. Boerner; *Vice-President*, E. Daecke; *Secretary*, W. J. Fox; *Treasurer*, H. W. Wenzel.

D. M. CASTLE, *Secretary pro tem*.

The Entomological Section of the Chicago Academy of Sciences met in the John Crearar Library, at the usual hour, January 21, 1904.

Present—W. K. Higley, A. B. Wolcott, Wm. J. Gerhard, Emil Liljeblad, Alex Kwiat and W. E. Longley.

Mr. Wolcott read his paper on the characteristics and distribution of the Coleopterous genus *Charissa*, of which he had numerous specimens on exhibition.

It was an able paper, and unfortunate that so few were present to hear it.

Election of officers postponed until next meeting.

*Secretary pro tempore*.

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held January 28th, Mr. Philip Laurent, Director, presiding. Ten persons were present.

Mr. Rehn exhibited some New Jersey Orthoptera, among



them an apparently new species of *Melanoplus*. *Melanoplus impudicus* Scudder was taken. This species has been previously recorded from Georgia and Mississippi. *Paroxyia scudderi* Blatchley, previously recorded from Indiana only, was captured.

Dr. Calvert exhibited a ♂ and ♀ dragonfly taken at Salton, in the Colorado desert, southern California, by Prof. Wickham, 265 feet below the sea-level. The species was described by Currie as *Ichnura barberi*.

Mr. Laurent exhibited *Grapholitha caryana* reared from the husks of the hickory-nut. He also exhibited the cocoons of *Symphysa adelalis* Kft. on oak, taken at Anglesea. He found that a specimen of *Prionus laticollis* ♀ disclosed 440 eggs. Mr. W. R. Reinick was elected an Associate of the Section.

HENRY SKINNER, *Recorder*.

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Minutes of meetings of Brooklyn Entomological Society, Brooklyn, N. Y.

January 9, 1902.—Eighteen persons present. Prof. John B. Smith, president, in the chair. The annual reports of the treasurer, librarian and secretary were presented. The officers of the preceding year were re-elected. Mr. Roberts reported the capture at Lakehurst of *CælamBUS farctus*, *Agabus teniolatus* and *Hydroporus cimicoides*, and stated that the occurrence of the latter north of South Carolina had not been previously noted.

Mr. Franck reported that *Melipotis nigrescens* had been taken near Jersey City, although supposed to be confined to the southern states. Prof. Smith added that these examples afforded proofs of an extension of the southern fauna into the Pine Barrens of New Jersey, and suggested that all specimens should be accurately labeled, that records of such migration might be preserved. Discussion as to the best gum to be employed. Tragacanth was unanimously approved, shellac was also useful, but fish-glue had been known to melt in cases and became stringy in hot weather.

Prof. Smith exhibited a number of lantern slides characteristic of European rustic and urban life and illustrating methods employed in preserving forests from the ravages of insects.

February 6, 1902.—Eighteen persons present. Mr. Edward L. Graef, vice-president, in the chair.

Mr. Weeks read an English translation of a clipping from a German newspaper entitled “\$8,000 for a Butterfly” (*Ornithoptera paradisea*), with other instances of the extraordinary sums paid and hardships undergone to obtain various rare species, some of which were afterward taken in large numbers. Discussion by Messrs. Doll, Franck and Graef, giving instances of the capture of insects either rare or only locally so. *Catopsilia eubule* had been seen by thousands on the south shore of Long Island (Rockaway Beach), while *Colias cæsonia* had been taken in Prospect Park, Brooklyn. Mr. Doll stated that the first recorded capture of *Zeuzera pyrini* in this country was at Hoboken, in 1879, by Fred. Smith. The specimen was a female, found still living in a spider’s web, and was for many years in the Neumoegen collection.

Discussion as to the best methods of destroying mosquitoes and to what extent they acted as purveyors of disease. Mr. Weeks preferred draining or filling, wherever practicable, as affording permanent relief, to kerosene applications, which were only temporary.

March 6, 1902.—Twenty persons present. Prof. John B. Smith, president, in the chair.

Discussion as to the effect of heat and cold upon maculation of wings of Lepidoptera. Mr. Englehardt exhibited variations of *Vanessa antiopa* in which the blue submarginal spots were more or less obsolete, and which had resulted from the exposure of the pupæ, directly after the transformations from larvæ, to extremes of heat and cold. Mr. Wasmuth mentioned his capture of specimens of *Arctia arge*, the secondaries of which were highly suffused while the moths caught elsewhere in the vicinity were of the ordinary type. Mr. Weeks offered as an explanation that this arctian pupated in the spring, when the weather was variable, and inasmuch as the fresh pupæ were insufficiently protected, it was more likely to be exposed to and affected by extreme climatic changes, and that the location of the place of pupation as to whether the exposure were northern or southern might be a factor in causing variation.

Mr. Doll exhibited a fine series of *Junonia cœnia* showing extremes of light and dark forms either bred or captured by himself during a number of years.

Mr. Wasmuth exhibited a unique aberration of *Samia cynthia*, the submarginal band being nearly three-fourths of an inch in width, with increased lightness of color.

Mr. Weeks read a memorial upon the life of Mr. John Akhurst, a recently deceased member of the Society, with a description of his entomological collection, and presented resolutions of regret and condolence, which were unanimously adopted.

April 3, 1902.—Twenty-four persons present. Mr. Ludwig B. Goldhorn was elected a member.

Mr. Gustav Beyer related his experiences upon a collecting trip to San Lucia, Lower California. He remained there from February to October, and brought back many fine specimens of Coleoptera, embracing some new species. During the first six months no rain fell, and the excessive aridity rendered sifting and sweeping unavailable. He therefore had recourse to breeding, and transported thither five packing-boxes, the tops of which were covered with muslin. These were filled with larvæ-infested cactus logs. The larval borings could not be detected from the exterior, but by stripping off the outer bark the presence of the larvæ was easily ascertained. A few beetles, including some Cerambycidæ and Buprestidæ, were taken on leaves and flowers during the dry season. One large species of Scarabæid, *Megasoma thersites*, frequented the tree-tops, and could only be dislodged by climbing as high as possible and then violently jarring the branches. Mr. Beyer made a number of collecting trips to the mountains, with varying success. He exhibited many of the specimens taken.

Mr. Franck exhibited some interesting variations of *P. troilus* ♂, *P. turnus* ♀, *M. phaeton* and *C. philodice*, the primaries of the *troilus* being deeply indented with white, caused by the coalescing of the marginal lunules with the submarginal rows of white dots. The greenish tinge in the interior of the secondaries was also much lighter, and many of the submarginal spots were obsolete. Captured in New Jersey.

## Benjamin Franklin Koons.

Benjamin Franklin Koons died at his home in Storrs, Connecticut, December 17, 1903. He was born September 8, 1844, at Sulphur Springs, Ohio. At the age of seventeen he enlisted in the 123d Ohio regiment, and served till the close of the Civil War; after which he worked his way through Oberlin, graduating with the degree of Bachelor of Arts in 1874. Mr. Koons received the degree of Ph. D. from Yale University in 1881. He spent several summers working with the United States Fish Commission. In the fall of 1881 he was appointed Professor of Natural History in the Connecticut Agricultural College (then Storrs Agricultural School), and from 1883 until 1898 was at the head of the institution. From then until his death he was Professor of Natural History and Curator of the Museum, which contains valuable material largely collected by Professor Koons from many parts of the United States, including the National Park and Alaska. Although Professor Koons has published little of entomological interest, he was a careful student of the subject, keeping well informed. His popular lectures were interesting and instructive, and the students received much of practical value from his course in Economic Entomology. For many years he was Entomologist of the Connecticut State Board of Agriculture.

Professor Koons was a man of a quiet nature, but firm in his convictions. He was respected by all the students, and his death is mourned by many friends.

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CORRECTIONS IN THE LIST OF NORTH CAROLINA CICINDELIDÆ.—There are two matters which need attention in my "List of the Cicindelidæ of North Carolina" (ENT. NEWS, vol. xv, p 26-32).

*Cicindela 6-guttata* has been taken at Raleigh, thus adding a new locality. This would scarcely be worthy of record were it not for the fact that it does not seem to be at all common here, the one specimen taken on April 29, 1903, by myself, being the only record.

The other matter is one of credit. Under *Cicindela purpurea* it should have been stated that the species was taken at Blowing Rock by Mr. C. O. Houghton and myself. We were together upon that occasion. Under *Cicindela abdominalis* Mr. Houghton should also have been given credit for taking the species with me at Southern Pines. Indeed, of the five specimens taken, Mr. Houghton captured three.—FRANKLIN SHERMAN, JR, Entomologist N. C. Dept Agr., Raleigh, N. C.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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## A New Alysiid from Ceylon.

By WM. H. ASHMEAD, M. A., D. SC.

Mr. E. Ernest Green, the eminent Coccidologist of Ceylon, has recently sent to Dr. L. O. Howard a small collection of parasitic Hymenoptera for names, among which was a new Alysiid, in a genus not yet reported from oriental regions, which is described below.

Genus **ASPILOTA** Förster.

### **Aspilota ceylonica** n. sp.

♂.—Length 1.5 mm.; ovipositor subexserted. Black and shining, impunctate; first segment of abdomen testaceous; palpi yellowish-white; two basal joints of antennæ and the legs honey-yellow, the trochanters, tips of tibiæ and the tarsi yellowish white; flagellum black, pubescent, the first joint a little longer than the second; wings hyaline, the nervures brown.

*Type*.—Cat. No. 7725, U. S. N. M.

Paradeniya, Ceylon. Described from two specimens bred by Mr. E. E. Green from a Dipterous larva living in decayed fungus.

## A New *Thanaos* from Southern California.

By FORDYCE GRINNELL, JR., Palo Alto, Cal.

### *Thanaos callidus*, n. sp.

♀.—Antennæ blackish throughout, with inconspicuous annulations extending to the club; club entirely black. Palpi clothed with long, black hair, intermixed with grayish hairs, the ventral part more gray than the dorsal. Eyes very dark brown or black. Primaries blackish, thickly overlaid by grayish hairs; dark brown towards inner edge. Fringes with long hairs, same color as adjacent parts of wing, 1 mm. wide; a black line extending parallel to the fringe. The discal area is marked by four black crescents, the concave sides facing; the crescents forming a  $\{\}$ . Midway between these discal markings and the outer edge are two rows of black dashes, crescent-like and forming almost two parallel lines, 1.5 mm. apart. The inner row extends from the costa three-quarters of the way to the inner margin, while the outer extends about half-way. Secondaries dark brown, sprinkled with long, black hairs; a tortuous row of round, lighter spots extends from costa to inner margin, parallel to outer margin. Fringes continuous with those of the primaries. Underside brownish, lighter towards outer margin. Fringes blackish. A row of round whitish spots on secondaries parallel to outer margin.

♂.—Differs from the female in having the upper side of primaries blackish, with fewer gray hairs, and these confined to the region of the anal angle, but spreading to the apex. A small white discal spot, and midway between this and outer margin a group of three whitish spots, arranged in a diagonal line and close together; a somewhat large, white spot in the same plane, half-way between costal and inner margin. Secondaries black or very dark brown, a slighter darker shade along the outer margin, otherwise without markings. Underside of primaries brownish, with the same markings as the upper side. The secondaries brownish with a faint indication of three whitish spots in the anal angle. Thorax and abdomen with black hairs, interspersed with grayish ones. Expanse of male and female 30 mm.

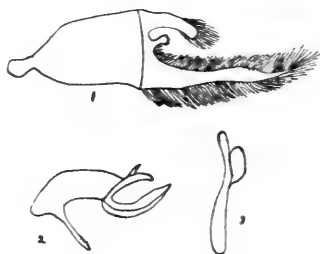
Appendages of the male:—The side or clasping organ is large and quadrangular in outline; the cephalic portion tapers more or less abruptly downward and ends in a knob-shaped structure. The thickest portion is in the middle which is marked by a suture. The caudal portion consists of three projections; the lower is longest and tapers to a point, but enlarges in the middle and toward the cephalic part and is clothed with quite long hairs. The upper is about half the length of the lower, is slightly curved and blunt at the extremity, with a few long hairs. The middle projection is short and distinctly knobbed and leans forward into the arch formed by the upper organ. The structure which holds the anal opening is very peculiar in shape; it projects up between the two

side or clasping pieces. It is curved; at the lower end it is tapered and has a long, slender, downwardly projecting piece, notched at the lower end, which probably serves as a prop. The upper part is modified into a clasp, with three peculiar hook or grasping pieces for holding the anus; the lower two are longest and are curved downward and upward forming a cup; the upper piece extends upward and has on its dorsal-cephalic part a small hook, curving cephalad. The structure which holds the penis is also peculiar and consists of two pieces; one long, slender and funnel-shaped and large at the lower end; and the other broad and leaf-like, joining to the middle of the other piece; a funnel-shaped depression is thus formed for the reception of the penis.

Habitat:—Mt. Wilson, Sierra Madre Mountains, Los Angeles County, California. Altitude, 5886 feet. Discovered June 6, 1903, flying very rapidly around the *Ceanothus* and scrub-oak shrubs on the summit, in the hot sunshine.

Types, four males and one female, to be deposited in the collection of the California Academy of Sciences. The markings of the female are peculiar and characteristic and will serve to distinguish the species at a glance; while the abdominal appendages of the male are peculiar and characteristic in structure.

The figures have been drawn by the author from the appendages of a male mounted in glycerine jelly on a slide, and preserved with the type. Fig 1 represents the side or clasping organ; Fig. 2, the structure which holds the anal opening; Fig. 3, the structure which holds the penis.



THE manuscript of a Catalogue of North American Diptera by Prof. J. M. Aldrich has been accepted for publication by the Smithsonian. The contract has been let for the printing, and he expects proofs almost any time. It will appear in the series called "Smithsonian Miscellaneous Collections," the same which includes both first and second editions of Osten Sacken's catalogue.

There will be about 7000 species of Diptera recorded from North America in the new catalogue, and about 32,000 bibliographical references. It will make at least 750 pages printed. There are about 900 titles in the bibliography, which includes economic and morphological papers.

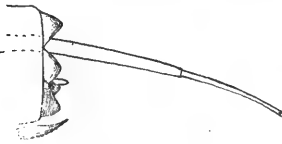
## Two Species of Hydroptilidae.

BY NATHAN BANKS.

The following two species of Hydroptilidae occur commonly around Washington, D. C., and will be included in list of local forms. The form described by Chambers as a Tineid moth under the name of *Clymene agerifasciella* has been referred to this family; it is, however, I think, a Hydropsychid, and has four spurs on the middle tibiae, and the hair of wings is not erect.

### *Orthotrichia americana* n. sp.

Head with a dense tuft of snow-white hair between eyes, a broad white median stripe on the thorax, and the anal region of forewings gray-white; so that when the wings are closed there is a median white dorsal stripe the entire length. Antennae wholly pale whitish; legs pale, unmarked, spurs 0, 3, 4; hind tibiae with long white fringe behind. Wings acute, anterior pair brown, with some white hairs, mostly forming several white spots near costal margin



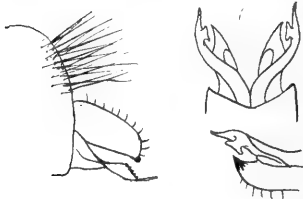
ORTHOTRICHIA AMERICANA, genitalia.

toward tip. Hind wings narrow, with long pale-gray fringe; hair of abdomen long and appressed. The male shows the long, two-jointed penis, as in the common European species, and a black ventral plate, hid in dense hair. Expanse, 4.8 mm.

Many specimens from Washington, D. C., in July and Aug.

### *Allotrichia maculata* n. sp.

Head with tufts of white hair over bases of antennae and on the vertex; also on the lateral lobes of thorax. Ocelli present. Antennae pale on basal half, then wide black band, then a narrow white band, then a broad black one, with a narrow white tip. Legs pale, anterior tibiae and tarsi marked with brown on the outer side; hind tibiae with long white fringe behind; spurs 0, 3, 4. Wings dark brown, a white spot on costal third, one at pterostigma, a smaller one near the tip, three on posterior margin, one near middle, and one on apical fourth; there are black spots adjoining most of the white ones; and two other black patches, one at tip, and one on posterior margin near tip. Hind wings with gray fringe, black around the tip. Expanse, 5 mm.



ALLOTTRICHIA MACULATA, genitalia.

Specimens from Falls Church, Va., in August and September.



## The North American Species of Chlorion.

BY H. T. FERNALD, PH.D., Amherst, Mass.

A careful study of a large number of specimens of the large blue or greenish sphecid wasp received from all parts of North America, where it occurs, has led to some conclusions which may be of interest.

This insect is labeled under various names in different collections, those most frequently met with being *Chlorion cæruleum* Drury, *C. cæruleum* Linn. and *C. cyaneum* Dahl., which calls for an examination of the synonymy of the species.

Linnaeus in the tenth edition of the *Systema Naturæ*, I, p. 571 (1758), describes his twenty-second species of *Sphex* as follows: "28. *S. cærulea*, alis ferrugineis basi nigris. *Mus. De. Geer. Habitat in America meridionali. Magnitudo Crabronis. Alæ ferrugineæ, basi nigræ, apice albicantes. Antennæ basi nigræ, apice ferrugineæ.*"

This is the first use of the specific name *cærulea* for a *Sphex*. In the twelfth edition of the *Systema Naturæ*, I, p. 947 (1766), this description is copied word for word for the thirty-eighth (and last) species of *Sphex* given in that work. But on page 941 of this same book, the second species under the genus *Sphex* is also given the name *cærulea* (!), and it is described as follows: "2. *S. cærulea*, alis fuscis. *Amœn. acad. 6 p. 412. n. 90. Catesb. car. 3. p. 5. t. 5? sed punctum nullum in alarum apice. Habitat in America septentrionali.*"

Comparison of these descriptions with the insect under consideration shows that the one found in the tenth edition cannot apply; indeed, it would seem probable, as Dr. F. Fr. Kohl has stated, that it is the description of some southern *Pepsis*. Hence this description in both editions must be thrown out of consideration. But its presence in the tenth edition of the *Systema Naturæ* makes the *cærulea* described on page 941 of the twelfth edition a preoccupied name, and we therefore have for this last insect a description but no tenable name. The description in itself might, perhaps, apply to the wasp here treated, but it is too brief and vague to give any certainty, though the reference in it to Catesby suggests a possible way

of learning to what insect Linnæus intended this description should apply. Catesby's figure, however, gives but little assistance. The drawing is smaller than the insect here considered, but I can find no evidence that Catesby's figures have any definite relation to the size of the objects they represent. Still the figure is evidently of a Sphecid, and of one with a petiole longer than the abdomen—a character not true for the present case. So far as any conclusion can be drawn from the figure, it is more suggestive of a *Podium* or *Pelopæus* than of a *Chlorion*. We must therefore conclude that while it is possible that the description on page 941 of the twelfth edition of the *Systema Naturæ* may be of this insect, the evidence from Catesby's figure does not sustain this, and that in any case the description is without a tenable name.

De Geer (*Mem. hist. nat. Ins.*, III, pp. 585–589, pl. 30, figs. 1 and 6, 1773) recognizes both of the Linnæan *cæruleas*, but remarks of the one given only in the twelfth edition that it is of mediocre size, and as he provides no name to take the place of the preoccupied one his writings afford no assistance.

Drury (*Ill. Nat. Hist. Ex. Ins.*, II, p. 75, pl. 39, fig. 8, 1773) figures what is evidently the insect for which we are seeking a name, and gives a fair description of it. But he calls it *Sphex cærulea* of Linnæus, and refers to page 947 of the twelfth edition—the wrong *cærulea*—plainly an erroneous identification.

Dahlbom (*Hym. Eur.*, I, pp. 22 and 24, 1843) gives two descriptions which need consideration. To one (p. 22) he assigns the name *Chalybion cyaneum*, and to the other (p. 24) the name *Chlorion cyaneum*. Of these, the first can be thrown out as not applicable in the present case, leaving *Chlorion cyaneum* as the first available name to apply to our North American *Chlorion*.

Kohl (*Ann. naturh. Hofmus. Wien.*, V, pp. 186–187, 1890) distinguishes two species among the specimens of this insect accessible to him, naming them *Sphex (Chlorion) nearcticus* and *S. occultus*. The chief differences between these species are that in *C. nearcticus* there are no punctures on the collar, those on the frons are finer than in *C. occultus*, and the

clypeus in the female is slightly longer than the third segment of the antennal filament. In *C. occultus* the collar, anterior part of the mesonotum and the mesopleura are coarsely punctured, the frons is more coarsely punctured than in the other species, the mesopleura are in part coarsely rugose, as is also the dorsum of the median segment, and the clypeus in the female is shorter than the third segment of the antennal filament.

Examination of a large series of specimens convinces me that these distinctions cannot hold. Nearly all the examples agree in some of the characters named with *C. nearcticus*, but in others with *C. occultus*, and in many cases the division between the two is about equal. Apparently *C. nearcticus* and *C. occultus* represent extreme degrees of the variation of a rather variable species, *C. nearcticus* applying to those forms in which the punctures and rugosity are least developed, and *C. occultus* to those in which they are most strongly marked.

*Chlorion ævarium* Patton (Can. Ent., XI, p. 133, 1879) is, as Patton himself says (Proc. Ent. Soc. Wash., III, p. 46, 1894), a variety of this insect, having a bronze color. The shade of color seems to be connected with the locality from which the insect comes, specimens from New England and the Middle Atlantic States being bronze-blue, those from the States next south and including Kansas being deep blue, but often with a bronze tinge, those from Missouri, Tennessee and farther south deep blue, while examples from Mexico, Arizona and California show transition shades from deep blue through greenish blue to a bright green.

It is interesting to note that this insect has been captured in Massachusetts as far north as the southern side of the Holyoke range of mountains which crosses the Connecticut valley in a northeast-southwest direction, though in Amherst, which extends to the top of this range on its northern side, it has never been taken, nor do I find any record of its capture toward the eastern end of the State.

Arranged in regular form the more important synonymy of this species will stand as follows :

**CHLORION CYANEUM** Dahl.

- ? || *Sphex cærulea* Linn., Sys. Nat., 12th ed., I, p. 941, 1766.  
 ? || *Sphex cærulea* De Geer, Mem. Hist. Nat. Ins., III, p. 589, pl. 30, fig. 6, 1773.  
 || *Sphex cærulea* Drury, Ill. Nat. Hist. Ex. Ins., II, p. 75, pl. 39, fig. 8, 1773.  
 ? *Sphex cyanea* Fab. Ent. Syst., II, p. 201, 1793.  
 ? *Pepsis cyanea* Fab. Syst. Piez., p. 211, 1822.  
*Chlorion cyaneum* Dahl., Hym. Eur., I, p. 24, 1843.  
*Chlorion cyaneum* Dahl. Hym. Eur., I, p. 435, 1845.  
 ? *Sphex cærulea* Lepeletier, Hist. Nat. Ins. Hym., III, p. 336, 1845.  
*Chlorion ærarium* Patton, Can. Ent., XI, p. 133, 1879.  
*Sphex (Chlorion) nearcticus* Kohl, Ann. natur. Hofmus. Wien, V, p. 186, 1890.  
*Sphex (Chlorion) occultus* Kohl, Ann. natur. Hofmus. Wien, V, p. 187, 1890.  
*Chlorion cæruleum* Ashmead, Psyche, VII, p. 65, 1894.

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## List of Sphingidae, Saturniidae, and Ceratocampidae observed at Raleigh, N. C.

BY C. S. BRIMLEY.

### I.—SPHINGIDÆ.

#### **Hemaris thysbe** Fab.

Common in gardens in summer on flowers of larkspur, petunia and verbena. Dates, 1900, July 13 to August 15, September 12. 1901, June 13 to August 20. 1902, June 25 to August 15.

#### **Hemaris thysbe ruficaudis** Kirby.

Common in woods in spring on flowers of bush honeysuckle (*Azalea*), wild pinks (*Phlox*), and on wild plum (*Prunus chicasa*) blossoms. On March 27, 28, and April 1, 1903, was common on a lilac bush in my garden. Other dates were April 11, 18, 27, 1903.

#### **Amphion nesus** Cram.

One caught on flowers of yellow jessamine (*Gelsemium*), April 27, 1899.

**Deidamia inscriptum** Harris.

In June, 1903, I found seven Sphingid larvæ on Virginia creeper, which I took to be *A. myron*; these pupated from June 12 to 18; I left them for a little over three weeks, and then concluding they were all dead, put them up in alcohol. All this time I still looked on them as *myron*; a little while later, on examining them, I was struck by their utter lack of any of the characteristic markings of *myron* pupæ, the head also had several projections not present in *myron* pupæ, and on carefully going over all the descriptions in my possession of Chærocampine larvæ and pupæ, I concluded they were this species.

**Deileophila lineata** Fab.

This was common in summer of 1899, but dates were not recorded. In 1900 one was taken July 30 and another August 4, both on flowers of jimsonweed (*Datura*). In 1901, one, August 29, on *Datura*; one, September 2, on petunia; others, September 23, 24, 28, 30; October 1, on pink moonvine flowers; one, October 7, on honeysuckle flowers, at 11 A.M. In 1902 one caught in field in morning. Two larvæ brought to us September 10 and 12, 1902, said to have been found on collards.

**Theretra tersa** L.

1900, September 24; 1901, July 22, 27, August 7, 30, September 9, 11, 13, 28, all but two caught in house,—these July 22, on *Datura*, and August 7, on *Zinnia*. A full-grown larva was brought me September 22, 1902, said to have been found on persimmon.

**Pholus vitis** L.

September 2, 1901, two larvæ were brought to me, but I could not get them to eat anything, and both died.

**Pholus pandorus** Hübn.

1900, September 1, in house; June 18, July 10, August 9, in house; September 4, picked up on sidewalk; 1902, July 26, in house; October 2, resting on fence. Larvæ found on grape July 14, August 12, 1901; September 11, 1902. The larvæ

seem very subject to the attacks of Braconid and Tachinid parasites.

**Pholus achemon** Drury.

A number of larvæ of this specie, *P. pandorus*, and *A. myron* brought us September 11, 1902. From those belonging to this species I bred a number of pupæ, from two of which moths emerged on June 17 and 18, 1903. A specimen was caught in house August 12, 1903.

**Ampelophaga myron** Cram.

1900, July 22, in house; 1901, August 2, 4, 8, 27, 29, bred from this year's larvæ on Virginia Creeper; 1902, May 15, one bred from 1901 larva; June 24, one resting on geranium flower in daytime; July 10, 23, 26, August 1, 3, bred from same year's larvæ; 1903, June 2 3, bred from 1902 larvæ. Of five larvæ which pupated from August 8 to 17, 1901, the last four on consecutive days, two emerged as moths on August 26 and 29, a third on May 15, 1902, and the other two died. Larvæ may be found here from June to October.

**Phlegethontius quinque maculatus** Haworth.

Our commonest Sphingid, though curiously we have found only two larvæ; these found on tomato July 27, 28, 1901, pupated August 1, 3; moths emerged August 23, 26. The moths are very common on jimsonweed flowers at dusk. Dates for 1900, June 15 to 19, July 9 to August 26; 1901, June 11 to 28, July 23 to September 26. Both this species and the next were exceedingly abundant in 1901, and have been much scarcer since.

**Phlegethontius sexta** Johan.

Nearly as common as the preceding; larvæ very common on tomato, jimsonweed and allied plants. In 1900 eleven larvæ pupated from August 19 to September 2; from seven of these moths emerged on the following dates, June 15, 18, 20, 21, July 11, 28, August 8, 1901. Dates for the moths: 1900, June 14 to 19, July 17 to August 22; 1901, June 11 to 25, July 17 to September 24. The moths are nearly as common on jimsonweed flowers as the preceding, but do not come out

as early in the dusk of the evening. The larvæ are much subject to the attacks of Braconid parasites.

**Phlegethontius rustica** Fab.

1900, August 15, one on jimsonweed flower; 1901, September 5, one on rose, a larva found in October, 1901, on ash, and another in October, 1902, also on ash; in summer of 1903, three larvæ found on *Chionanthus*, and one on privet; all four succumbed to the attacks of Braconid parasites.

**Phlegethontius cingulata** Fab.

The larvæ were very common on Japanese morning-glories on my porch during the summer of 1899, but owing to the attacks of Braconid parasites, I succeeded in rearing only one moth. In 1900 moths were taken on jimsonweed flowers July 17, August 14, 16; in 1901, June 14, July 23, 24, 29, 30, August 5, all on jimsonweed; September 6, 23, on pink moon-vine; 1902, August 26. The pupæ are often ploughed up in the sweet-potato fields. Two moths emerged in 1903 as late as the first week of October, though I have not the exact date by me, the specimens having passed out of my possession.

**Sphinx plebeia** Fab.

1900, July 31, Aug. 21; 1901, July 23, all on jimsonweed flowers. Two larvæ found on crossvine (*Bignonia capreolata*) in September, 1901, and another on trumpet vine (*Tecoma*). A moth emerged from one of the first two May 27, 1902.

**Dolba hylæus** Drury.

1901, August 1, one on jimson weed flower.

**Ceratonia amyntor** Geyer.

1902, May 26, one bred from larvæ on elm. Have seen the larvæ frequently in the fall on elm, and once on birch in summer (August, 18, 1902).

**Ceratonia undulosa** Walk.

1899, April 16, 25, bred from pupæ found in winter; 1900, April 28, bred from pupa; July 28, bred from larva found July 7, on *Chionanthus*, pupated next day and emerged twenty days later. In 1901 the larvæ were very common on ash and

*Chionanthus* during the months of August, September and October. The larvæ pupated from August 30 to the middle of October; next spring the moths emerged from May 7 to July 15.

**Ceratonia catalpæ** Boisd.

1901, September 11, one picked up dead; two caught in house in previous years. 1903, thirty-one larvæ brought me, said to have been found on a *Catalpa* tree; these were nearly full-grown, and pupated three or four days later.

**Smerinthus jamaicensis** Drury.

1899, April 21, one bred from pupa; 1903, June 16, 30, two, both bred.

**Paonias excæcatus** S. and A.

1899, one found, just emerged and resting on a weed, in July; 1901, July 17, one bred from pupa: 1903, June 29, July 11, two, both bred. In the fall of 1902 I had three "*Smerinthus*" larvæ, two with the caudal horn greenish and the lateral stripes nearly meeting on the back, and one with caudal horn bluish and stripes distant dorsally; during the winter I had a pupa brought me, and from these four bred two specimens of this species and two of the preceding. Larvæ of this or the preceding are not infrequently found on willow and also on apple and plum.

**Cressonia juglandis** S. and A.

I found the larvæ of this on young hickories, mostly under four feet in height, in large numbers in the fall of 1901, and in lesser numbers in 1899 and 1902. June 27, 1900, one bred from larva which had pupated September 30, 1899. May 12, 1901, one caught flying in my garden at dusk. August 14, 1902, one caught in house.

II.—SATURNIIDÆ.

**Samia cecropia** L.

Not common. I bred one from cocoon found on buttonbush (*Cephalanthus*), the moth emerged June 3, 1900.

**Callosamia promethea** Drury.

The cocoons of this species were quite common in the fall of



1898, and somewhat less so in 1899; since then I have not seen any. Dates: 1899, May 2, 4, 7, 10, 16, 19, 25, 27, 28, June 4; 1900, May 12, 14, 22, 26, 28, and one in June; all bred from cocoons found during the previous winter. The cocoons were commonest on sassafras, but were also frequently found on tulip poplar, and an occasional one on a number of other species of trees. Newly emerged females attracted the males, sometimes in some numbers, twelve being the largest number in one afternoon, no males came to the females earlier than 4 P.M., nor later than 6 P.M. I bred an *Ophion* from a cocoon May 26, 1900.

**Callosamia angulifera** Walk.

May 27, 1903, a male picked up in my garden.

**Tropæa luna** L.

Larvæ very common on sweetgum (*Liquidambar*) in the fall of 1901, much less common in 1902 and 1903. In 1900 I found a larva on sweetgum, on September 29; it spun October 1, and the moth emerged May 4, 1901.

**Telea polyphemus** Cram.

Very common, the larvæ and cocoons being found most frequently on elm and maple, also occasionally on oak and birch. In 1903 moths emerged from cocoons found in winter, on the following dates: May 10, 11, 14, 15, 16, 18, 20, 21, 23, 26, July 14, 26, 27, 29, 31, August 2, 5, 6, 8; the cocoons were all kept out-of-doors in a rather cool place.

**Automeris io** Fab.

The larvæ of this species seem most commonly to be found on cotton in this locality and are usually known as the Cotton Stinging Worm. From larvæ taken in the fall of 1902 a number of moths were bred which emerged on the following dates in 1903: June 23, 30, July 3, 7, 10, 11, 15, 22.

III.—CERATOCAMPIDÆ.

**Anisota stigma** Fab.

A number of larvæ found on oak in the fall of 1902. Moths were bred from these on the following dates in 1903: July 17, 23, 28, August 2, 3, 4, 11.

**Anisota senatoria** S. and A.

Larvæ often very common on oak. I had about two dozen to bury in the fall of 1902, and did not breed a single moth from the whole lot. I bred a male in August, 1900, from larva taken the previous fall.

**Anisota virginiensis** Drury.

A female taken at night in the pavilion at Pullen Park, just outside the city limits, in July, 1899.

**Anisota rubicunda** Fab.

Larvæ often very common on maple. From larvæ taken in fall of 1902 I bred moths on the following dates: June 2, 5, 9, 21, 1903.

**Adelocephala bicolor** Harris.

Three larvæ brought me October 9, 1901, said to have been found on Honey Locust. Three more in fall of 1902; from the latter one moth, a male, was bred on May 26, 1903.

**Citheronia regalis** Fab.

The larvæ are quite common on cotton, persimmon, and sweetgum, and are occasionally found on hickory, walnut, and sourwood. From three larvæ which buried on September 26, 27 and 29, two moths were bred, the moths emerging on July 17 and August 3, 1901.

**Basilona imperialis** Drury.

Larvæ are common on elm, pine, sweetgum, cotton and oak, but not as common as the preceding. From larvæ which pupated in the fall of 1902, moths emerged on the following dates: August 4, 5, 9, 12, 13, all being males.

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PROTANDRENÆ IN NEW JERSEY.—Some years ago I examined in the National Museum two males of *Protandrena* from Camden Co., N. J., a surprising locality. They were not reported in Dr. Smith's New Jersey list (2d edition), and seem to have been overlooked. They were like *P. asclepiadis*, but more robust, and I presume that they should be referred to *P. cockerelli* Dunning, described in the female only from Kansas. This is the more likely because the National Museum contains a male from Kansas agreeing with them.—T. D. A. COCKERELL.

## Micro-Lepidoptera—Suggestions.

BY W. D. KEARFOTT.

(Continued from p. 95, Vol. xv, No. 3.)

### *Part II.—Collecting.*

The favorite European practice is to bring home the specimens alive, each in a small willow-chip pill box, killing them in the evening or the next morning just before expanding. The chief merit of this system is in the naturally relaxed condition of the moths, but its disadvantages seem to me to far outweigh the advantages, principally in the large bulk and great number of boxes that have to be carried, the danger of the moths flying around in the confined space and losing their scales, and the always possible catastrophe of a stumble or fall by which a goodly number of the fragile boxes will be reduced to splinters.

Of course, the ideal way of obtaining flawless specimens of Micro-Lepidoptera is by breeding, which will be the subject of the next paper; but as many specimens can be taken with a net, that may never be secured in any other way, it is desirable to have the apparatus to fit the smallness of the specimens and to be as simple as possible.

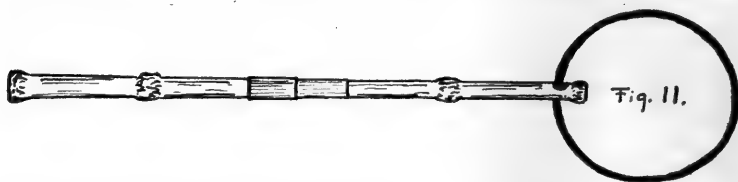
**THE NET.**—The net is the most important part of the outfit; and I have gradually reduced the size of the one I use to only about half the diameter of the common butterfly kind. It is six inches in diameter at the top, and in length twice its diameter or twelve inches (the same ratio should be used for any diameter). I have tried all sorts of patent and folding nets, but they all seem to be weak in some part, and give out when most needed. A frame and stick I have used constantly for over three years was made as follows:

The frame is a piece of three-sixteenths diameter spring brass wire, total length about twenty-four inches, bent in a circle, with two four-inch straight ends, like Fig. 10. The stick is a slender bamboo cane, cut to a length of two feet; both ends should terminate at a joint. In the smaller end, just below the joint, cut a small hole on each side, and below the holes for two or three inches wrap the bamboo with fishing cord to



stiffen it and prevent the holes from becoming cracks. The stick can also be divided in the middle, with a pair of ferrules from an old fishing rod securely fitted to the cut ends; which will make it possible to stow all apparatus away in bag or pockets and avoid the scornful looks and remarks of those who do not entirely appreciate the scientific value of our pursuit.

Fig. 11 shows the jointed stick, with the straight ends of the frame tucked into the holes provided for them, which latter



explains the reason for selecting bamboo, namely, that it is hollow between the joints, and in addition is very light and strong.

The best and most durable material I have been able to find for net-making is white *mousseline-de-soie*, which can be bought at any drygoods store; it is a very fine mesh silk veiling, and so woven that the threads do not draw apart, as is the case with any material woven gridiron fashion, like common mosquito netting. The net is cut leg-of-mutton shape, and the seams should be sewed down on both sides; at the top should be sewed a piece of two inch wide white silk ribbon, turned over, to make a channel for passing the wire through (Fig. 12). Be sure the small end at the bottom is well rounded,



leaving no corners.

**KILLING.**—Ether and chloroform are objectionable from the fact that insects killed by their use usually die with muscles so rigid that it is often difficult to properly set them, and even after taken from the setting board, with wings flat, there is a strong tendency to revert to the position in which they died.

Insects killed with cyanide of potassium, on the contrary, die in a perfectly relaxed condition. I have never used spirits of ammonia, but imagine it would tend to affect the colors, especially greens and pinks.

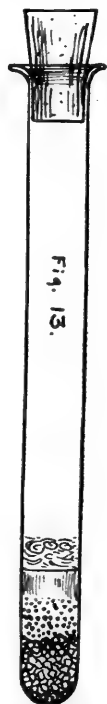
My cyanide bottles for micros are made of the common test-tubes which can be purchased in any drug store for a few

cents each. The most satisfactory size is about six inches long by three-quarters of an inch in diameter. It is well to have more than one for fear of accident, and also that too many moths may not be in the same tube at the same time. Three or four can easily be carried in top coat pocket, and when I expect a big day's work I load both top coat and vest pockets.

The cyanide should be crushed into small lumps, about size of buckshot, and put in bottom of tube from one-half to three-quarters of an inch deep; on top of this put a layer of sawdust one-quarter to one-half inch thick, and on top of the sawdust pour a teaspoonful of liquid plaster-of-paris. The chemical action caused by the contact of the sawdust and cyanide very much increases the strength of the latter. Leave open for a couple of hours and then push a small piece of absorbent cotton in the tube, shoving it down as flat as possible against the plaster. This will prevent the moths from sliding around over the smooth surface of the plaster and rubbing off their scales. Fig. 13 shows a test-tube properly charged, and it is surprising, considering the very small amount of cyanide, how long its strength continues at full power. I have some that are still as good as new that were made two and three years ago. Their length and slightly flared mouth make it particularly easy to manipulate them inside the net. But they are much more fragile than the ordinary bottle or jar, and the greatest care should be used, in case of an accidental break, to dig a little hole and bury all the fragments in the earth. If a finger is cut by the sharp edge of the broken glass, get it immediately into water, rubbing vigorously to get all the poison out of the wound.

COLLECTING BOX.—The best boxes are made of thin sheet zinc, which does not rust like common tin, nor verdigris like brass. My boxes are oval in shape, and are cork-lined inside on both bottom and top.

Two sizes are convenient to have, the smaller about 5 by 3



inches and the larger about 7 by 4 inches. Either can be carried in a side coat-pocket. I also use these same boxes all winter for relaxing dried specimens; a teaspoonful of water is sufficient, and for very small Tineids and Tortricids four to six hours will make them just as soft as they were when first killed; much longer than this will make them wet, and once wet it is impossible to do anything with them. A longer time, say twelve hours, for the large, robust-bodied Tortricids and medium-sized Pyralids, and the large specimens of the latter family can remain twenty-four hours in the relaxing box without coming to harm. While on the subject of relaxing, it might be well to observe that it is very advantageous to use two boxes at the same time. The largest we can call the storage box, which must be kept tightly closed all the time except when opened quickly to transfer half a dozen to a dozen insect specimens into a smaller box; from the latter they are to be taken one by one for setting. If only one box is used, and fifty or more specimens are under way, the constant opening and releasing the moist air will cause a good many of the last specimens to become too dry to work with. For this same reason, pick out and spread those with the smallest bodies first. I do very little setting in the summer time, simply pinning the specimens when fresh and storing them away until winter, and find no difficulty at all in getting the moths as perfectly spread as if this work had been done when they were freshly killed. But if the time is available, and it is preferred to set the specimens as soon as possible after they are caught, it will then be well to sprinkle a little water on the cork of the box while out in the field or woods, so the moths will not dry too much before getting home.

The brown canvas or khaki cartridge bags, sold in gun and sporting-goods stores, with a leather shoulder-strap, are very convenient and of light weight for carrying such of the apparatus as the pockets will not hold; they are made in several sizes, and range in price from sixty cents to one dollar and a half.

The above apparatus, with a supply of pins, forceps (Fig. 2) and a short stick or two of elder pith are all that are needed

for collecting the perfect insects. Skill with the net is easily acquired, and slipping the cyanide tube into the net and securing the moth requires no particular explanation, a half-day's work will result in both operations becoming very easy. But bear in mind that more than two or three specimens in each tube will probably cause all to lose much of their freshness. When this number is in each tube, sit down on a log, rock or fence-rail, with back to the wind, open collecting box and place on knees, then gently tilt one tube so that the moths drop into the upturned top of box; with forceps lift up and pin as described on pages 90 and 91, sticking the pinned specimens in the bottom of the box. If any of the moths stick to the cotton in tube, either shake it gently or use the fine-pointed forceps. It is not well to empty the moths from all of the tubes into top of box before beginning to pin, for fear of the moths coming in contact, wind blowing them around, or the fence-rail breaking; expose just as few at a time as possible, and remember that a day's work which consists of only a dozen perfect and flawless specimens is of far more real value than one in which two hundred are brought home in any old condition.

While Micro-Lepidoptera can be taken every hour of the twenty-four and almost every day of the year, there are, of course, times and places more favorable than others, and a reference to some of these and the general habits may be of interest.

Pyralids are easily disturbed in the daytime, when walking through the undergrowth of thickets and light woods, and while the flight of some species is swift, the majority do not fly more than twenty feet before seeking a new place of rest, which is almost invariably on the *under side* of a leaf; to catch them, the eye must be kept on the leaf, and after approaching it quietly drop the net almost to the ground, and with a quick upward sweep and a turn of the wrist, the game will usually be found inside.

Tortricids are as a rule even slower flyers than the pyralids, and unless a wind is blowing to assist them, will rarely fly more than five or six feet; they are as easily disturbed as the

Pyralids in the daytime ; but, while smaller, they are easier to see, as they usually alight on the *upper side* of a leaf.

The majority of Tineids keep themselves well hidden during the daylight hours, and only come out for their natural flight about the time the sun goes down ; and a good day's work can be done during this twilight hour, for a half hour before sunset until too dark to see. Back of my home, in the Orange Mountains, in a favorable spot in the open woods, surrounded by low shrubbery and weeds, I have often caught one hundred and more Tineids during this hour, without moving half a dozen steps from one spot. This time of day also seems to be the time of natural flight of a good many species of Tortricids, especially the earliest warm spring days in March and April, and the Indian Summer days late in the fall, November and December. Many species of Tortricids can be taken in abundance at these seasons that were before rare and almost unknown. On March 14th last year I spent an afternoon in the woods, and only caught three or four specimens up to five o'clock, but from then until dark I secured several dozen. November 3d I started collecting at ten in the morning and at four-thirty in the afternoon had perhaps two dozen well-earned specimens ; but then the flight began, and until it was too dark to see I caught them just as fast as I could bottle them, more than one hundred specimens, and all very good ones.

The trunks of trees should be carefully examined in the daytime ; many a good Tineid or Tortricid will be found in the crevices of the bark, and the bottle can be employed directly on the moth, without the use of the net.

Light in an open window or the electric lights in front of stores are also very attractive to nearly all moths. Sugaring does not produce satisfactory results with the micros. I cannot urge too strongly the more general use of a Moth Trap by all collectors who are located in the country or suburbs, where it can be placed so that the light shines over a patch of weeds or an overgrown thicket, and where it will be safe from boys who think it a joke to break the glass ; as it works while we sleep. The trap I have had the most success with is an adaptation of one described in vol. vi of the Bulletin of the Brook-



lyn Entomological Society (1883), and a cross-section is shown at Fig. 14, and an outside view at Fig. 15. The dimensions are about forty inches long, of which ten inches are the lamp

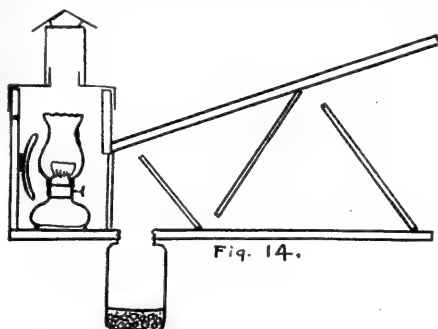


Fig. 14.

compartment: the wide flaring mouth or open end is about eighteen inches square; the width at the other end tapers to nine inches; and on the back of the lamp compartment is a hinged door. The whole frame of the trap is made of one inch thick poplar,

except the top of the lamp space, which is better of tin to avoid danger of fire. A hole on top, with a bottomless tomato can for a chimney, will prevent the wind from blowing out the lamp. The oblique lines in the sectional view are sheets of glass, the outer and inner beginning at the bottom and reaching to within one inch of the top, the middle sheet starting at the top but not reaching the bottom by one inch. Of course, a fourth pane of glass separates the lamp from the trap proper. On the floor of the inner compartment, just in front of the lamp space, is a circular hole for the insertion of the cyanide jar.

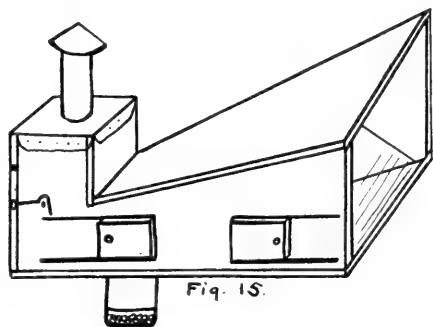


Fig. 15.

This should be a one- or two-quart Mason fruit jar with screw-top. The most convenient way to use the jar is to have two screw-caps, one of which has the entire top cut out, leaving only the screw-ring; this ring should be permanently fastened in the hole made for it in the bottom of the trap; a good joint can be made by tacking a lid of a cigar-box on one side of the hole; then lay the ring (with big end down) on the

cigar-box lid, and carefully pour plaster of paris around it until all the space is filled; after the plaster hardens, the cigar-box lid can be pulled off and thrown away.

Then, just before dark, remove the solid cap from the jar—which should be tightly stoppered all day to regain its strength—and screw it up into place and, after lighting the lamp and watching it awhile to see that it does not smoke, it

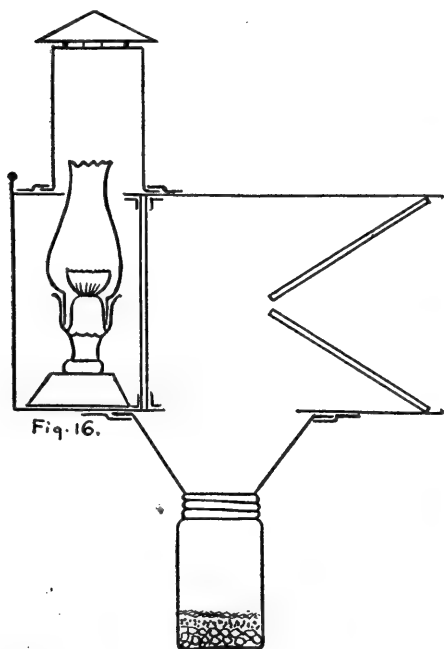


Fig. 16.

is ready to work all night. With this trap, in my home locality, I usually caught from fifty to three hundred specimens each night, from April to November, of which seventy-five per cent. were Tortricids and Tineids.

Beetles do not seem to be particularly attracted, which is very fortunate, as an able-bodied specimen would work havoc before he succumbed.

I neglected to say that all of the inside of the trap should be painted with several coats of good white paint, and a silvered-glass reflector put

on the door back of the lamp; both add to the glare and attractiveness. For protection the outside should be painted dark green.

A very much smaller and simpler trap is shown in section at Fig. 16. But it will require the services of a tinsmith, as it is nearly entirely made of that material. This is the design perfected by my good friends in West Brighton, Pa., F. A. and Harry D. Merrick, and to them I am indebted for the sketch and the following description. The total length is fifteen inches, by eight inches wide and eight inches from top to

bottom. The lamp compartment is four inches long. The chimney and top of lamp compartment are made to slide into place, and the same arrangement is provided for the funnel-shaped piece at the bottom, into the small end of which a Mason fruit-jar screw-top, with the centre cut out, is soldered.

These slots or slides are shown in the sectional drawing by what look like detached pieces, but of course they are soldered or rivetted to the body of the trap.

The entire back of the trap is a door working in grooves, and can be entirely removed at the top. The hole in the top for the lamp chimney is placed over the front end of the lamp space, so that the lamp can be easily removed by tilting. There are only three sheets of glass, all of them  $7\frac{3}{4}$  inches square. The two front ones are arranged as shown, and come to within half an inch of each other in the middle. They, as well as the sheet of glass in front of the lamp, are held by grooves made by turning up the edge of a strip of tin. The great advantage of this form of trap is that it is easily portable, as the projecting pieces, top and bottom, the glasses and the lamp can all be removed, and the whole apparatus packed in a telescope travelling bag sixteen inches long by eight inches square. One-pint jars are amply large for this trap. It should also be painted white inside and green outside. Last year the Merricks started one trap about the middle of June and a second one early in August; this season they have four ready awaiting the first mild night. The great advantage that must not be lost sight of is that they "work while we sleep."

The large jars for traps should be made with a layer of cyanide lumps as large as a chestnut, about one inch deep on the bottom, over this another inch of damp sawdust, with sufficient plaster-of-paris to hold all in place.

This will make a very powerful jar, killing almost instantly, but it is also liable to become very wet after having been in use a short time, therefore pieces of blotting paper, cut exactly the diameter of the inside of jar, should be put in from time to time to absorb the excess moisture, and the layer of raw cotton on top of the plaster may have to be renewed every two or three days, to prevent soiling the insects.

After sending the copy of the first part of these Suggestions to the Editors, I received from the American Entomological Company a sample card of American-made steel, black japanned, needle-pointed pins, which are far superior in finish, stiffness and springiness to any European-made pin I have ever seen. No. 00 is a trifle less in diameter than the No. 1 Kirby, which latter is about the thickness of No. 0. I can heartily endorse these new pins; the best grade are to be known as "No. 210 Special double japanned." The only criticism to be made is that the heads are a separate piece; but this may be remedied if we all bring pressure to bear on the makers and insist on a head that cannot come off.

(To be continued).

NOTE ON DURATION OF LARVAL STAGE OF ODONATA.—During the late summer of 1902 the water in Green's rock quarry dried completely up, and remained so for at least two months. Unfortunately, I did not notice the dates when the pool dried and when it filled up again. On July 22 and August 10, 1903, I found in the quarry exuviae of recently transformed *Anax junius*; on September 5, 1903, of *Tramea carolina*; on August 10, of *Lestes forcipatus*; on August 10 and 18, of *Pachydiplax longipennis*; thus apparently showing that these four species had in this case completed their transformations in less than six months. The quarry had not any water in it in the previous fall before late November at the earliest; thus the eggs of these species must have apparently been deposited in the spring of 1903.—C. S. BRIMLEY, Raleigh, N. C.

INTERNAL PARASITES OF THE DUCK.—The writer spent the summer of 1903 upon a farm in the northwestern part of Connecticut. In the latter part of July it was noticed that a large Pekin drake began to look emaciated and sickly. All efforts to bring it back to health failed, and a week or so later it died. Postmortem examination revealed a large number of maggots feeding upon the flesh in the posterior part of the abdomen. Apparently the adult flies had deposited their eggs in or near the anus of the drake, and upon emerging the young larvæ had worked their way into the surrounding flesh. A number of the maggots were allowed to complete their life-history in confinement. This was accomplished in about two weeks. Some of the adult flies were identified by Mr. D. W. Coquillett, of the United States National Museum at Washington, who found that there were two species belonging to different genera, *Phormia regina* Meigen and *Lucilia cæsar* Linne. By far the greater number were of the former species. No differences were noticed in the larvæ; but this is not strange, as little attention was given to them until the imagos had emerged.

I can find no record of similar parasitism of birds.—A. VINCENT OSMUN, Amherst, Mass.

# ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—Ed.

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PHILADELPHIA, PA., APRIL, 1904.

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Convocation week of the American Association for the Advancement of Science will be held in Philadelphia during December, 1904, and January, 1905, and at that time the Association of Economic Entomologists and the Entomological Club of the A. A. S. will meet in the same city. We hope that the Entomological meetings will be a great success and largely attended. Philadelphia may be called the cradle of Entomology in America, and there is much here that should interest visiting entomologists. There is no doubt but that the Entomological Section of the Academy of Natural Sciences, the American Entomological Society and the Feldman Collecting Social will do all in their power to entertain visiting entomologists. It may be early to mention these facts, but we do so that all desiring to come can arrange their plans in advance.

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## Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS  
OF THE GLOBE.

MR. PHILIP LAURENT is at Gulf Hammock, Levy Co., Florida.

MR. W. D. KEARFOTT, Mr. Erich Daecke and Dr. Henry Skinner contemplate an expedition into the wilds of the Great Notch, northern New Jersey.

THE American Entomological Company has placed on the market a new make of pins, both bright and Japanned. They appear to be an excellent article.

MR. JOHN M. GEDDES, of Williamsport, Pa., is at Stuart, Dade Co., Florida.

PROF. A. J. SNYDER, of Belvidere, Illinois, contemplates a collecting trip to Utah, Idaho and Oregon this summer. He may decide to reside in Oregon permanently.

ON PAGE 78 of the February number of ENT. NEWS the item about *C. eubule* strikes me.

This butterfly has been seen and collected in Nonquitt, Mass., for several years. I noted it first in 1898 and took several specimens, as did Miss Eliot. My record of its presence was published in *Psyche*, December, 1898. We have seen the butterflies there in succeeding years, but I believe Miss Eliot did not see them last year—an exceptionally poor year for moths and butterflies. It is evidently established there, for the butterflies have been too fresh to have flown far or long.—CAROLINE G. SOULE.

DUPLICATION OF SPECIFIC NAMES.—A glance at any catalogue will reveal the fact that many specific names have become exceedingly common. Isn't it desirable to avoid this? Dr. P. P. Calvert makes it a point to propose no new specific name twice in his specialty—the Odonata. This is believed to be a good plan. In large orders such a course would make the selection of names a difficult task indeed; but in the case of the large Orders one could modify the rule to cover only superfamilies.

Let us not duplicate a specific name in an Order if the Order is small, and let us not duplicate a specific name in a Superfamily of the large Orders.—HENRY L. VIERECK.

IN REPLY to Prof. P. Jerome Schmitt's inquiry regarding my experience with *Galerita* taken on Stone Island, Fla., I would state that I took colonies of *Galerita bicolor* mingling with *Brachynus alternans* and *Chlœnius erythropus*, in and under decayed pine logs. So far as I can remember, they all bombarded. Many of them, when first disturbed, and again when picked up, would repeat the same performance, the report being quite loud, and the discharge very acrid, leaving a painful burn and a deep-brown stain on the fingers, which would take several days to wear off.—D. M. CASTLE, 2007 Arch St., Philadelphia, Pa.

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## Doings of Societies.

A regular meeting of the Entomological Section of the Chicago Academy of Sciences was held Thursday evening, February 18th, at the John Crerar Library. Eight members and one visitor present. Election resulted as follows: *Chairman*, W. E. Longley; *Recorder*, A. Kwiat; *Executive Committee*, John L. Healy, Wm. J. Gerhard, A. Kwiat; *Honorary Curator*, A. B. Wolcott.

Mr. Longley reported on the work of the Section during

1903, adding a summary of the more important entomological work done by others.

A discussion of the species of *Rhopalocera* occurring in the Chicago area followed. This will probably be resumed when time and occasion permits.

Two boxes of butterflies from South America, which our visitor, Mr. Block, exhibited, were also discussed and partly identified by the aid of the *Biologia-Centrali Americana*.

Adjourned 9.45 P.M.

A. KWIAT, *Recorder*.

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The meeting of the Feldman Collecting Social was held on February 17th, at the residence of Mr. H. W. Wenzel, 1523 So. 13th Street, Philadelphia. Eight members were present.

Dr. Skinner referred to a recent article on protective coloration in moths, in which it was suggested that the hind wings of *Catocala* were a protection against birds in consequence of their bright color, a theory which the speaker could not support. He pointed out that *Catocala* seldom fly, except at night, their hind wings being therefore concealed at a time when birds are on the search for prey.

The members discussed the capture of Coleoptera by traps.

WM. J. FOX, *Secretary*.

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A meeting of the American Entomological Society was held February 25th. Dr. Calvert, President, in the chair. Seventeen persons were present.

Mr. Rehn exhibited *Chorisonura*, a genus of roaches represented by a new species from the coast of South Carolina. He had also received *Ischnoptera johnsoni* from Virginia.

Dr. Calvert exhibited in Riker mounts the Coleoptera he used in class work in the University of Pennsylvania. They were arranged to show several families and their characteristics in each box. He then made remarks on the more recent classification of the Order and quoted from various authors on the subject. The same speaker also exhibited under the microscope specimens showing the development of the wing in the larval stages of the potato beetle.

Mr. Wenzel said the proposed classification as given by Dr.

Calvert differed radically from that of LeConte and Horn, and would require much study before an intelligent opinion could be passed on it.

HENRY SKINNER, *Secretary*.

Minutes of meetings of Brooklyn Entomological Society, Brooklyn, N. Y.

May 8, 1902.—Twenty-four persons present. Prof. John B. Smith in the chair.

Mr. Gustav Beyer exhibited a fine series of Coleoptera taken by him in Southern California, embracing *Acanthoderes*, *Malodon*, *Trichodesma*, *Acmaeodera*, *Hololepta* and *Brenthus*, the majority of which he had bred from larvæ as described in the minutes of the last meeting.

Prof. Smith exhibited small elm twigs showing borings made by the larvæ of *Anthaxia viridicornis* and *Neoclytus erythrocephalus*, collected after the severe sleet storm in the latter part of the winter, and stated that many specimens of these beetles had thus been obtained, with some half dozen others, including *Saperda tridentata*. He recommended this method as productive of excellent results.

Mr. Ernest Shoemaker exhibited his large water-color painting of Lepidoptera, containing drawings of sixty-five specially selected and rare native and exotic species. The labor connected therewith had occupied him about 1600 hours during the past five years, and he gave some data as to the special work upon certain specimens. Mr. Shoemaker's production was greatly admired, not only for the beauty and arrangement of the insects, but also for its accuracy.

June 5, 1902.—Twenty-one persons present. Professor John B. Smith, president, in the chair. A committee of three was appointed to consider the question of reprinting or revising "Explanation of Terms used in Entomology."

Mr. Weeks spoke on the subject of "Duration in Pupal Stage by Hibernation and Æstivation," and among other examples cited that of a pupa of *Acronycta americana*, which he had found under a decayed board on Long Island in the spring of 1901 (pupation had undoubtedly occurred in the fall of 1900), and which at the date of the meeting was still in a pupal condition and alive. (The moth emerged on June 8,



1902.) This pupa had been kept in an extension with southern exposure, which during the summer became excessively warm, while the pupa itself, though not entirely deprived of moisture, had many times been neglected for considerable periods. Mr. Weeks added that after "sugaring" assiduously for several consecutive years, he had observed that many noctuids were very irregular as to numbers from one year to another. In certain years a species would almost disappear, while in others it would occur in abundance. Although these irregularities might in many cases be ascribed to stress of weather, parasitism, etc., there was much to be explained as to the factors which control emergence, that it may be not only as simultaneous as possible, but should also occur when a suitable temperature prevails.

Mr. Wasmuth gave instances of a *T. polyphemus* which passed over a year, and of a *C. regalis* two years, in a pupal condition. In the latter case the yellow maculation was transformed to a brilliant orange. His *Ceratonia amyntor* did not emerge from the pupæ this year.

Mr. Franck added that many of his Sphingidæ often greatly retarded their appearance.

Prof. Smith mentioned that nut weevils frequently passed two or three years as pupæ.

Dr. Call reported that although there were hundreds of the exuvixæ of the seventeen-year locust in Prospect Park this year, he had only obtained three imagos, and attributed their scarcity to the English sparrow, which eagerly devoured them.

It having been stated that Dr. W. S. Barnes had been unable to find any traces of *Sphinx elsa* in Arizona, Mr. Doll replied that cattle cropped the herbage so closely as to practically destroy the food-plant, and thus cause the disappearance of the insect over wide areas. It could still be found locally.

Mr. W. Grosbeck, of Patterson, exhibited a large series of crayon drawings of caterpillars, moths, etc.

October 2, 1902.—Fourteen persons present. The librarian presided in the absence of the president and vice-president. Mr. Louis H. Joutel, of Manhattan, New York City, was elected a member.

Reports of collecting experiences during the past season

were given by various members. Mr. Martin had collected in Germany and taken many Lepidoptera and Coleoptera; Mr. Engelhardt, at Hudson, N. Y., Hymenoptera; Mr. Franck, at Beaver Brook, Sullivan Co., N. Y., where he had tested a new lamp and taken many specimens; Mr. Richardson, on Staten Island and at Cape Cod. In both localities he had found *Sphecius speciosus* very numerous, had observed its habits and taken many specimens. He also observed a species of *Sphex* alight upon a spider's web and feign to be crippled and exhausted. When the spider approached to inspect her supposed prey the wasp pounced upon her. Mr. Weeks related a similar incident which he had seen. Mr. Schaeffer reported the capture of *Monedula carolina* on Staten Island. This insect occurs frequently in the South but rarely here. Mr. Barber visited Cold Spring Harbor, L. I., and spent three months at Mount Katahdin, where he took some Elateridæ and Buprestidæ, but few Lepidoptera on account of the wet and cold. Mr. Doll, in the Catskill and Adirondack Mountains. Among the Coleoptera taken in the Catskill Mountains were *Saperda calcarata*, var. *adpersa*. Of Lepidoptera, three specimens of *P. leonardus*. Mr. Watson, at Jamesburg, in August, reported the occurrence of this butterfly there in numbers. Mr. Goeben, at Callicoon, Sullivan Co., N. Y., and Mr. Pearsall, in Ulster Co., N. Y., found collecting rather meagre. Mr. Weeks, at Brooklyn, reported that he had sugared continuously throughout the season and made short trips to the suburbs. He had taken many specimens of all orders. *Catocala* were comparatively rare, due probably to the severe sleet storm in the latter part of the winter, which had dislodged and destroyed the ova.

ARCHIBALD C. WEEKS, *Secretary*.

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### Dr. Hans Herman Behr.

Dr. Hans Herman Behr, physician, scientist, author, poet, humorist and savant, is no more, and the world of science and letters must mourn the departure of one of its brightest lights. He died Monday, March 6, at 11 o'clock, at his residence,

1215 Bush Street, in the presence of friends of nearly half a century's standing. His life work was finished and at the ripe age of 86 he has passed away, leaving to posterity all the results of the scientific research into which his master mind had delved.

In San Francisco Dr. Behr has been most generally known as the Vice-President and Curator of the Academy of Sciences, that excellent institution which owes so much to his efforts. In the scientific world, however, he was reckoned among mental giants, for in many branches of science, particularly that of entomology, he was an authority of world-wide prominence.

He was born August 18, 1818, in Coethen, the capital and residence of the Duke of Anhalt-Coethen. He received a classical education at the Prince's College, in Zerbst, and at the gymnasium of his native city, passing thence to the universities of Halle and Wuerzburg, where he studied medicine and natural science. He was graduated as a doctor of medicine from Berlin University on March 23, 1843.

As long ago as the time of his graduation he displayed a passion for research in the field of entomology, and at the urging of Alexander von Humboldt and other distinguished scientists, who were his intimate friends, he began the wonderful travels which led him eventually all over the known globe and over a good part of that portion which is even yet practically unknown. He visited Australia, Java and Brazil, and lived two years in the Philippines. His work was ever at the front. The miasmas of swamps, the bites of the deadliest reptiles, the attacks of the fiercest of wild beasts, were all braved by the intrepid naturalist, who deemed life itself but a small matter compared with the securing of some specimen of insect existence hitherto unknown to science. He returned to Berlin, and there practiced medicine, but the fever of research was too strong, and he again went out into the wilds. He penetrated the most remote spots in the East Indies, still collecting, and then, in 1853, he came to San Francisco. Here he decided to settle, and here he wrote the books which have brought him fame and will remain as a monument to his energy for all time.

Since 1864 he has been a Vice-President of the Academy of Sciences, to which institution he presented his wonderful collection of insects.

While Dr. Behr was the recipient of many honors from different institutes of learning all over the world, the most notable tribute to his attainments was given by his alma mater, the Frederick William University of Berlin, upon the occasion of his eightieth birthday. The honorary degree of doctor "Honoris Causa," was then bestowed upon him, a distinction never before given to a German-American. The presentation of the diploma was made the occasion of a magnificent function in Beethoven Hall, on August 18, 1898, prominent citizens of all walks of life uniting to do him honor and telegraphic congratulations being received from all parts of the world.

Apart from his numerous works on scientific matters, Dr. Behr was the author of several volumes of prose and poetry. A story of adventure in the Philippines had a large sale in Germany, and some of his poems were published in the leading magazines of his native land. Another book by him is now in the press.

Nor was the late savant a philosopher of the "dry-as-dust" variety. He was a valued member of the Bohemian Club and he could hold his own with the best of the raconteurs. He had a keen, incisive, but always kindly, wit. His knowledge of men and affairs, together with the vast knowledge he had gained in far countries and strange places, made him the most companionable of men, and his loss will be felt with particular keenness by the more intimate of his associates.

Arrangements for the funeral have not yet been completed, but as the deceased was a Catholic, the funeral ceremonies will be conducted under the rites of that church.

—*San Francisco Chronicle.*

Strecker's Cat., 1878, III, gives sixteen titles of articles on American insects by Dr. Behr. In later years he has published in "Zoe" and other magazines. A number of our butterflies were made known to science by Dr. Behr, particularly *Neophasia terlooti*.—Eds.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XV.

MAY, 1904.

No. 5.

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## Notes on Some Mosquito Larvæ Found in New Jersey.

BY JOHN B. SMITH

(With Plates IX, X, XI, XII.)

### *Culex trivittatus* Coq.

This is a grayish-black mosquito, with two white longitudinal stripes on the dorsum of the thorax. The legs and the beak are not banded, while the segments of the abdomen are white marked laterally and often across the dorsum.

Larvæ were first taken by the Messrs. H. H. and E. Brehme, who were exploring the woodland pools on the hills back of South Orange. Each turned in a bottle of larvæ and pupæ that were determined to be a mixture of *Conchyliastus musicus* and *Culex sylvestris*. From the E. Brehme bottle, *C. musicus* and *C. sylvestris* adults emerged July 2d, and in addition several examples of what was recognized as a species new to us. The remaining larvæ were closely examined, but could not be differentiated from *sylvestris*. Meanwhile a large number of pupæ had developed and from these and from the collected stock *C. trivittatus*, *C. sylvestris*, *C. canadensis*, *C. territans* and *C. musicus* emerged. No larvæ of *trivittatus* were obtained from this series.

From the H. H. Brehme bottle there emerged, on July 2d, *C. musicus*, *C. sylvestris* and *C. trivittatus*. July 3d, *musicus* and *sylvestris* hatched. The larvæ were carefully examined in alcohol, and three full-grown individuals were separated out as probable *trivittatus*.

A second collection made by Mr. E. Brehme, July 1st, yielded more adults and larvæ. Collections made in the Hatfield Swamp, August 11th and 12th, also by Mr. Brehme, yielded yet further specimens, always in company with *C. sylvestris*.

Outdoor captures of *C. trivittatus* adults were made July 2d, at Trenton, by Mr. Grossbeck; July 4th and 5th, at Chester, by Mr. Dickerson; July 13th at Summit, July 17th and 18th at Deckertown, July 21st and 22d at Lake Hopatcong, all by Mr. Grossbeck, and September 3d, in the Great Piece Meadow, by Mr. E. Brehme.

The larva (Plate ix, fig. 1) is a stout, rather chunky wriggler, grayish in color, 7 to 7½ mm. in length, and in general build like *sylvestris*, with which it occurs. The head is comparatively small, one-third wider than long, evenly rounded in front, brownish in color, darker at the base and blotched on the vertex. The antenna (fig. 2) is less than half the length of the head, sparsely set with rather large spines, tapering a little toward the tip which is blunt, set with one long and one short spine, a bristle and a stout little articulated peg. The mandible (fig. 3) is set with small spines on the dorsal surface of the base, and this is one of the few species so distinguished. The mentum is triangular, the height at centre is equal to two-thirds the base, the lateral margins are a little curved, the teeth are small. The maxillary palpus is shown at figure 5; the mouth brushes are of the usual form, its hairs pectinated.

Thorax somewhat angulated at the sides, marking the segments, and with a tuft of long hair at each angle. It is somewhat wider than long, with two transverse depressions on the dorsal surface.

Abdomen with the segments well marked, each with a lateral tuft of long hair, decreasing in length posteriorly. The comb on the eighth segment is arranged in an irregular patch

of from 14 to 22 scales, as shown at figure 6. The individual scales are shown at figure 7, and are ovate, the sides fringed with spines which lengthen toward the tip, so that at this point there is a long straight barb.

The anal siphon (fig. 6) is short and chunky; very dark brown, almost black, in color. It has the usual double series of spines, and these are of moderate length, taper rapidly to a long acute tip, and tend to have short teeth near the base on the inner side.

The anal gills are short, without obvious tracheæ, and the species has the normal *Culex* habit of getting air through the siphon only.

#### **Culex discolor.**

This is a yellowish-brown mosquito, of moderate size, the body mottled and variegated with brown, legs and beak banded, wings spotted. This combination occurs in no other New Jersey species, and makes it an easily recognizable form.

Larvæ were collected by Mr. W. P. Seal, at Delair, June 18, 1903, and received at the laboratory June 20th. They were recognized as new to us, attracting attention, first, by their unusually prominent, white antennæ; second, by the very long anal gills; third, by the habit of resting on the bottom, back down, antennæ pointing upward, and mouth-brushes kept in constant motion. Pupæ were formed June 23d and 24th, and on the 27th and 28th adults emerged,—a pupal period of four days. A second lot was received July 24th, but they were small, did not do well, and only one female adult was secured August 8th. Mr. Seal states that these larvæ are rare, and he noted their habit of remaining below the surface and feeding at or near the bottom. A single larva was also received from Mr. J. T. Brakeley, taken at Lahaway, Ocean County.

The larva (Plate x, fig. 1) is from 7 to 8 mm. in length, including the anal siphon, and is yellowish brown in color throughout. The head is almost as large as the thorax, widest at the eyes, a little excavated before the antennæ, front square. The antennæ (Plate x, fig. 4) are white, almost as long as the head, thickest centrally, with an out- and an

in-curve, terminating almost in a point. The tuft is well below the middle, and consists of about a dozen hairs that do not reach to the tip. The two long, spine-like hairs on the inner side, half way between the tuft and the tip, represent two of the four articulated spines usually found terminating the antennæ. The mandibles (Plate x, fig. 6) are peculiar in that they have only a single dorsal spine; all the other New Jersey species have two or more. The mouth-brushes (Plate x, fig. 2) are entirely composed of simple hair. Mentum triangular, almost as long as wide, with nine teeth to each outer edge. The thorax has rounded outer margins and is somewhat wider than long. Abdominal segments subequal, narrowing a little backward, curiously shaped in connection with the oblique base of the siphon. The comb or pecten (Plate x, fig. 8) consists of a series of from 5 to 8 scales attached to a narrow band like a fringe, and not directly set into the skin. The individual scales (Plate viii, fig. 9) are oblong, the sides fringed with spines, two longer spines at each lower angle, and a very long pointed process extending centrally. The anal siphon (Plate x, fig. 7) is small for the insect, about three times as long as wide, with two curved spines at apex, an unusually large hair tuft below the spines, and a series of from five to eight slenderly toothed spines on each row. The individual spines (fig. 10) vary somewhat, but always have the long, slender processes. The anal gills are twice as long as the siphon, taper to almost a point, and are well provided with tracheæ, indicating the bottom habits of the larva.

***Culex aurifer* Coq.**

This is a medium-sized, rather long-legged mosquito, with unbanded beak, legs and abdomen. The thorax is golden brown, with the disc black, forming an undefined central band. It bites viciously, but seems to be very local even in the territory where it has been found.

Larvæ were taken by Mr. J. Turner Brakely, at Lahaway, late in April and in May, 1902. They occurred at a few points only in larger bodies of water, mixed with *canadensis*; but very rare, comparatively. One of the places where they were found



was in the water covering a cranberry bog. This bog was dry all during the summer of 1902 and until late in fall, when all adult mosquito life had disappeared into hibernation or elsewhere. The larvæ were found so early that there could not have been any eggs laid by hibernating individuals. It is probable, therefore, that the eggs were laid on the bog itself during the summer of 1902, like those of *canadensis*, and that they hatched as soon as the temperature of the water began to rise well above the freezing line. The habits of the larvæ are normal for the genus, and the duration of the pupal stage varies from two to five days.

The larva (Plate xi, fig. 1) is from 7 to 9 mm. in length, brownish black, tapering a little posteriorly. The head is transversely elliptical, almost as broad as the thorax, broadest just behind the eyes. The antenna (fig. 3) is white, tipped with black, almost half as long as the head is broad, thickest near base, tapering slightly to about the middle, then curved inwardly to a blunt tip. The surface is set with small spines, there are three long and one short spines at the apex, as well as a little articulated peg. The tuft consists of from 6 to 10 hairs, and is situated above the middle at the obtuse angle formed by the curve. In life the antennæ are very conspicuous, the black tip contrasting strongly with the white base. The mentum (fig. 6) is broadly triangular, the height at middle equalling about half the width. Figure 2 shows the head drawn from a cast skin, while the mandible and maxillary palpus are respectively shown at 4 and 5. The hair on the mouth-brushes is simple.

The thorax is transverse, edges of the segments marked so as to form three angles, each angle marked by a tuft of long hair arising from a distinct tubercle. There are two smaller tufts at the cephalic margin.

Abdominal segments 1 to 6, inclusive, have lateral tufts of long hair; segment 2 has an additional tuft of short hair nearer the hind angle, while segments 7 and 8 have short tufts only. On the eighth segment the lateral combs consist of patches of from 25 to 30 scales each, arranged as shown at figure 7; an individual scale being shown from above and from the side at

figure 9. Figure 7, by the bye, was drawn from a cast skin, and the tube, from pressure, is made to appear broader in proportion than is natural. The anal siphon is three and one-half times as long as the width at base, and does not taper much toward the apex. The two rows of spines contain each from 14 to 20 small, slender, pointed processes, the inner edge of which is shortly toothed, as shown at figure 8.

The anal gills are only a little longer than the ninth segment, and are not prominent nor supplied with obvious tracheæ. Evidently this is a species that depends entirely upon getting its air supply through the surface film of the water in which it lives.

#### **Anopheles crucians** Wied.

This is a little the smallest of the three species that occur in New Jersey and, in a way, is intermediate between them. The wings are more spotted than in *maculipennis*, less so than in *punctipennis*; the last vein is white, marked with three black spots. The palpi are white marked at the base of the joints.

A specimen was bred by Dr. H. P. Johnson in 1902, from a mixed lot of pupæ, probably received from Delair, N. J. Two specimens were taken in the same year, at Lahaway, by Mr. J. Turner Brakeley. Several specimens came in material received from Mr. W. P. Seal, at Delair.

In 1903 a very fresh-looking specimen was taken by Mr. Grossbeck, July 30th, at Port Reading, and this is the northernmost point in New Jersey where the species has occurred.

Among the mosquitoes that came to the porches at Cape May, soon after sunrise in midsummer, I detected this species, and instructed Mr. Henry L. Viereck to locate the breeding-places and work out the life-history. He finally located the breeding-areas in the Cape Marsh, and examples of the larvæ were sent in, August 3d, September 5th and September 28th. The records show their occurrence almost continuously between these dates, and the adults also were recorded almost daily. The females began their attack before sundown, and were again active for some little time after sunrise. During the latter part of the season the period of activity lengthened,

beginning while the sun was yet well above the horizon and continuing until the middle of the morning. Should this species prove to be a malaria-carrier, there would be no chance of avoiding it without confinement in a mosquito-proof shelter from 3 P.M. of one day to 11 A.M. of the next. Indeed, on cloudy days specimens are on the wing almost all day.

In general appearance the larva does not differ from those of *maculipennis* and *punctipennis*, but range only from  $5\frac{1}{2}$  to 6 mm. in length. The color in general is a dirty grayish brown, the chitinized parts a clear light brown; but this differs and, in life, the specimens vary as much as in the case of the other species. The head (Plate xii, fig. 2) is broadest just behind the eyes, narrowing to a rounded front, the line interrupted by an offset bearing the antenna. This offset is really a distinct sclerite, immovably attached to the head, upon which the antenna is articulated. The maculation of the head is variable; but, as a rule, the larger blotches are central, with smaller spots arranged about it. There is a transverse row of six branched hairs before the middle. The antenna (fig. 3) is set with little spines, and is shorter, stouter and much darker than in the allied species. At the tip are two long spines or blades, partly serrated, on the inner edge two short articulated processes, and six long hairs. A four-branched hair arises from the shaft about one-third from base. The mouth-brushes are very dense, the hairs simple. The mentum (fig. 6) is elongate, obtusely triangular, with only a few blunt teeth, similar to that in the allied species. The mandible (fig. 5) differs from that of *maculipennis* and *punctipennis* by having four instead of three curved spines on the dorsal surface. The maxillary palpus (fig. 4) has four spines and two spatulate processes at its tip, and at a distance of about one-third from tip a thick spine which divides into a number of branched hairs.

Thorax subquadrate, the angles rounded, with six lateral tufts of branched hairs, and similar smaller tufts on the dorsum.

The first three segments of the abdomen have long, branched hair laterally, the next four have small tufts of simple hair,

the eighth segment is provided with lateral combs of from 6 to 8 long teeth and from 1 to 4 short teeth, like figure 9, between them. On all these segments there is a small chitinized plate near the anterior margin and around spot behind,—all most obvious on the hinder segments. Joints 3 to 7 have also a palmate hair on each side near the posterior margin. Figures 7 and 8 show a lateral and dorsal view, respectively, of the respiratory structures. The ninth segment bears a chitinized saddle; on the dorsal surface are two plumose hairs and a tuft of long, sparsely branched hairs. On the ventral surface is a fan-like tuft of branched hair. The tracheal gills are less than half as long as those in *A. maculipennis* or *A. punctipennis*.

Altogether, this larva is separable from those of its allies by satisfactory, readily recognizable characters.

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## The Coleoptera of the Sacramento Mountains of New Mexico.—II.

By W. KNAUS, McPherson, Kansas.

I include under the above head several species of *Cicindelida* and a few other species taken at Santa Rosa and Alamogordo, New Mexico.

My second trip to the Sacramento Mountains was made the first week in August, 1903, and a week was spent at Cloudcroft and immediate vicinity. Collecting covered the dates August 3rd to 10th. Many species taken in June, 1902, were also found here in August, but a majority of the species had disappeared and had been succeeded by others at the latter date. Insect life in general, however, was not so prolific as in the earlier months of the year previous.

The elevation of Cloudcroft, 9000 feet, made the nights cool, and on only one evening, August 9th, was the temperature high enough to tempt any considerable numbers of Coleoptera to come to the electric lights.

The total number of species in this list, about 130, includes none that were given in my first list, published in the NEWS for June, 1903. Of those listed in this paper, Mr. T. D. A. Cockerell informs me that eight genera and twenty-five species

are new to the New Mexican fauna. The collecting the past two seasons in these mountains has added more than seventy-five species and twenty-five genera to the New Mexican list of Coleoptera.

Thanks are due to Mr. H. C. Fall, of Pasadena, California, for identifications, and to Mr. T. D. A. Cockerell, of Colorado Springs, Col., for notes.

Collections July 31st were at Santa Rosa, and August 10th at Alamogordo.

N. = new to New Mexico. G.N. = genus new to New Mexico. R. = recorded (in N. M.) only from.

- 1, 12 *Tetracha carolina* Linn. At electric light, Alamogordo.
- 2, 25c *Cicindela cinarrona* Lec. In canyon near summit, over 8500 ft. high, Cloudcroft; only one specimen taken but others seen.
- 3, 28 *Cicindela fulgida* Say. On alkali flats near Santa Rosa; common. R. Albuquerque.
- 4, 40 *Cicindela punctulata* Fab. Santa Rosa, on alkali flats.
- 5, 40a " *micans* Fab. Common at Santa Rosa, on alkali flats. Brilliant blue and green colored specimens.
- 6, 51 *Cicindela sperata* Lec. Found on wet mud along margin of Pecos River, Santa Rosa.
- 7, 57 *Cicindela lemniscata* Lec. Taken in numbers at electric light at Alamogordo.
- 8, 58 *Cicindela circumpicta* Laf. Common on alkali flats at Santa Rosa.
- 9, 59 var. " *apicatis* W. Horn. On alkali flats near Santa Rosa. N.
- 10, 64b " *16 punctata* Klug. One specimen at the edge of Pecos River Santa Rosa.
- 11, 86 *Cychrus elevatus* Fab. One specimen, much more slender than typical form, was taken in canyon near Crystal Springs canyon, near Cloudcroft, at an elevation of 8500 feet, August 9th. One of the most southern records of this species. R. Beulah, Gallinas Canyon and Santa Fé Canyon, all in northern New Mexico.
- 12, 119b & c *Carabus agassizi oregonensis* Lec. Rather common in the canyons near Cloudcroft, under logs, chips, etc. Listed as a variety of *tædatus* in New Mexican lists.
- 13, 133 *Calosoma peregrinator* Guer. One specimen under electric light at Alamogordo.
- 14, 134 *Calosoma lugubre* Lec. One specimen at Cloudcroft. R. Roswell.
- 15, 388 *Bembidium intermedium* Kirby. Santa Rosa; common.
- 16, 678 *Anara remotestriata* Dej. Several specimens at Cloudcroft. R. Santa Fé Canyon (Snow), top of Las Vegas Range

- (Cockerell), Las Vegas (Martin Cockerell), Las Vegas Hot Springs (Cockerell), Havery's Ranch (Miss Ruth Reynolds), all in northern New Mexico.
- 17, Small Carabid near *Bembidium*, one specimen at electric light at Alamogordo.
- 18, 756 *Platynus dissectus* Lec. Number of specimens taken, but always singly; specimens not quite typical; Cloudcroft.
- 19, 940 *Cymindis cribricollis* Dej. Two specimens, Cloudcroft. New to southern New Mexico.
- 20, 1054 *Nothopus zabrodes* Lec. One or two specimens, Cloudcroft.
- 21, 1168 *Discoderus impotens* Lec. Two specimens, electric light. Alamogordo.
- 23, 1158 *Bradycellus rupestris* Say. One specimen at electric light, Alamogordo. New to southern New Mexico. Var. *congener* occurs in Mesilla Valley.
- 24, 1495 *Thermonectes ornaticollis* Aube. One specimen, Santa Rosa. N.
- 25, 1586 *Tropisternus triangularis* Say. Electric light. Alamogordo.
- 26, 1626 *Philhydrus nebulosus* Say. One specimen, Santa Rosa.
- 27, 9318 *Cymbiodyta morata* Horn. Two specimens, James Canyon, near Cloudcroft. R. near the Moqui villages.
- 28, 1700 *Necrophorus guttula* Mots. Two specimens, Cloudcroft.
- 29, 1706 *Silpha lapponica* Hbst. One specimen, Cloudcroft.
- 30, *Agathidium* sp. One specimen, Cloudcroft.
- 31, }  
32, }  
33, } *Aleochara*. Four species under decaying bark and at sap.  
34, }
- 35, 2098 *Quedius explanatus* Lec. Several specimens under stones and logs. R. Santa Fé Canyon.
- 36, 2100 *Quedius fulgidus* Fab. One specimen, Cloudcroft. R. Albuquerque.
- 37, 2148 *Tympanophorus puncticollis* Er. One specimen, Cloudcroft. N. genus and species.
- 38, 2167? *Philonthus hepaticus* Er. One specimen, Cloudcroft. R. Las Vegas.
- 39, *Staphylinid* specimen near *Lithocarus*, under bark, near Cloudcroft.
- 40, *Tachyphorus*, sp. dubious. One specimen, Cloudcroft.
- 41, *Medon*, species probably not described. One specimen, Cloudcroft.
- 42, 4683 *Pseudopsis sulcata* Newm. One specimen, Cloudcroft. N. (genus and species).
- 43, 2782 *Apocellus sphaericollis* Say. One specimen, Santa Rosa.
- 44, 2841 *Homatium pucillum* Grav. Three specimens, Cloudcroft. N.
- 45, 2900 *Siagonum punctatum* Lec. One specimen, under bark, Cloudcroft. N. (genus and species).

- 46, *Bazocera* n. sp. near *speculifer* Casey. Cloudcroft. G.N.  
 47, *Olibrus*, sp. dubious. One specimen, Wootens near Cloudcroft.  
 48, 2996a " *nigricollis* Lec. Common at Wootens near Cloudcroft. N.  
 49, 3000 *Olibrus semistriatus* Lec. Same as 2996a. R. Beulah.  
 50, 3037 *Megilla vittigera* Mann. Santa Rosa and Cloudcroft.  
 51, 3056 *Coccinella trifasciata* Linn. Four specimens at Wootens.  
 52, 3069 *Harmonia picta* Rand. One specimen, Wootens.  
 53, *Anatis lecontei* Casey. One specimen near Cloudcroft.  
 54, 3078a *Psyllobora tadata* Lec. Two specimens at Wootens.  
 55, 3101 *Hyperaspis fimbriolata* Melsh. Two specimens near Cloudcroft.  
 56, *Scymnus* sp. One specimen, Wootens.  
 57, 9914 *Lasconotus concavus* Cas. One specimen, Cloudcroft. N. (genus and species).  
 58, *Narthecius* sp. One specimen, Cloudcroft. G.N.  
 59, 3525 *Hister punctiger* Lec. Two specimens, Cloudcroft. R. Beulah.  
 60, 3586 *Saprinus oregonensis* Lec. Several specimens, Santa Rosa.  
 61, " New sp. near *pectoralis* group. Santa Ro.  
 62, 3673 *Carpophilus pallipennis* Say. One specimen, Cloudcroft.  
 63, 3719 *Nitidula bipunctata* Linn. Two specimens near Cloudcroft. N.  
 64, 3769 *Rhizophagus procerus* Cas. One specimen, Cloudcroft. N.  
 65, 3810 *Melanophthalmus americana* Mann. Two specimens, Cloudcroft.  
 66, *Europs* n. sp. One specimen, Cloudcroft. G. N.  
 67, 4065 *Epiphaniis cornutus* Esch. One specimen, Cloudcroft. N. G. & S.  
 68, 4253 *Drasterius elegans* Fab. Two specimens at light, Alamogordo.  
 69, *Elater* sp. One specimen, Cloudcroft.  
 70, 4322 *Melanotus fissilis* Say. Two specimens, Cloudcroft.  
 71, 4400 var. *Athous cribratus* Lec. Two specimens, Cloudcroft.  
 72, 4606a *Buprestis rusticorum* Kirby. One specimen, Cloudcroft.  
 73, 4814 *Ellychnia californica* Mots. Two specimens, Cloudcroft.  
 74, 5002 *Collops bipunctatus* Say. Several specimens, Cloudcroft.  
 75, 5109 *Listrus senilis* Lec. Wootens; common.  
 76, 5620? *Trox sonoræ* Lec. One specimen, Cloudcroft.  
 77, 5704 *Diplotaxis brevicollis* Lec. One specimen, Cloudcroft.  
 78, 5806 *Listrochelus disparalis* Horn. Two specimens, male and female, at light, Cloudcroft.  
 79, 5858 *Cyclocephala immaculata* Oliv. One specimen, electric light. Alamogordo.  
 80, 5865 *Cyclocephala dimidiata* Burm. One specimen at light Alamogordo.  
 81, 5869 *Ligyris gibbosus* De G. Several specimens at electric light, Alamogordo.  
 82, 5878 *Orizabus snowi* Horn. Several specimens, very small, under stones and logs, Cloudcroft.  
 83, 5887 *Dynastes grantii* Horn. One specimen taken at Cloudcroft in July. Unusually high elevation. (Silver City highest previous record known to Cockerell.)

- 84, 5893 *Allorhina mutabilis* Gory. One specimen at Wootens. Higher up than usual.
- 85, 5911 *Euphoria inda* Linn. Several specimens at Santa Rosa.
- 86, 5950 *Ergates spiculatus* Lec. One specimen at electric light, Cloudcroft. New to southern New Mexico.
- 87, 5965 *Homæsthesis integer* Lec. One specimen, Cloudcroft. N.
- 88, *Tragosoma sodalis* Casey. One specimen, Cloudcroft. N.
- 89, " *parvicollis* Cas. Two specimens, Cloudcroft. N.
- 90, 5976 *Criocephalus asperatus* Lec. One specimen, Cloudcroft. Not before recorded south of Albuquerque.
- 91, 6513 var. *Tetraopes femoratus* Lec. One specimen at Wootens.
- 92, 6628 *Cryptocephalus venustus* Fab. Two specimens, Santa Rosa. N.
- 93, 6707 *Diachus auratus* Fab. Two specimens, Cloudcroft.
- 94, 6879 *Diabrotica tricineta* Say. Several specimens, Santa Rosa.
- 95, 6880a " *tenella* Lec. One specimen, Alamogordo.
- 96, 6893a *Trirhabda luteocincta* Lec. Several specimens, Wootens.
- 97, 6898 *Galeruca externa* Say. Common at Cloudcroft.
- 98, 6909 " *notulata* Fab. Several specimens, Cloudcroft. Very high altitude.
- 99, 6957 *Disonycha triangularis* Say. Two or three specimens, Cloudcroft. New to southern New Mexico.
- 100, 6971 *Haltica foliacea* Lec. Several specimens, Cloudcroft.
- 101, 10421? " *vicaria* Horn. One specimen, Cloudcroft. N.
- 102, 6987 *Epitrix cucumeris* Harr. Common at Wootens; feeding on corn, beans and potatoes.
- 103, 7027 *Phyllotreta albionica* Lec. Common at Cloudcroft.
- 104, 7059 *Psylliodes convexior* Lec. One specimen at Cloudcroft. N.
- 105, 7254 *Asida opaca* Say. Three specimens at Cloudcroft.
- 106, 7319 var. *Eleodes pedinoides* Lec., var. *neomexicanus* Blaisd. Common at Cloudcroft. N.
- 107, 7323 var. *Eleodes obsoletum* Say., var. *knausii* Blaisd. Common at Cloudcroft. N.
- 108, 7339 *Eleodes nigrina* Lec. A large, robust race, not very common at Cloudcroft and Wootens. New to southern N. Mex.
- 109, 7464 *Tribolium madens* Charp. A few specimens at Cloudcroft. N.
- 110, 7532 *Hypophlæus parallelus* Melsh. Two specimens at Cloudcroft.
- 111, *Hymenorus* sp. near *occidentalis* Casey. Two specimens at electric light Alamogordo.
- 112, 7740? *Oxacis pallida* Lec. Two specimens, electric light, Alamogordo.
- 113, 7762 *Pentaria fuscula* Lec. A few specimens at Cloudcroft. New to southern New Mexico.
- 114, 7820 *Mordellistena inornata* Smith. One specimen, Wootens. N.
- 115, 7033 " *nigricans* Melsh. Several specimens at Cloudcroft.



- 116, 7846 *Mordellistena unicolor* Lec. A few specimens at Cloudcroft and Wootens.
- 117, *Notosus montanus* Casey. One specimen, Wootens. N.
- 118, *Anthicus* sp. One specimen at Wootens.
- 119, 7959 " *cervinus* Laf. Several specimens at Wootens.
- 120, 8056 *Macrobasis lauta* Horn. One specimen at light, Alamogordo. N.
- 121, 8138 *Cantharis puberula* Lec. One specimen, Wootens. N.
- 122, *Otiiorhynchidæ* sp. One specimen, Cloudcroft.
- 123, 8546 *Desmoris constrictus* Say. Several specimens, Wootens.
- 124, *Smicronyx* sp. One specimen, Cloudcroft.
- 125, *Epimechus* n. sp. One specimen, Wootens.
- 126, 9928? *Cossonus crenatus* Horn. Two specimens under bark, Cloudcroft. N.
- 127, 9074 *Pityophorus nitudulus* Mann. Several specimens, Cloudcroft. New to southern New Mexico.
- 128, 9200 *Hylurgops rugipennis* Mann. Common at Cloudcroft. Five or six other undetermined species of Scolytids

## A Supplementary List of the Diptera of New Jersey.

BY CHARLES W. JOHNSON, Boston, Mass.

Since the publication of Prof. J. B. Smith's list of the insects of New Jersey, in 1900, I have been able to add 166 species, making the total number of Diptera recorded from the State 1359. Prof. Smith, in his investigations of the Culicidæ, has added 23 to the list, and worked out the early stages of 31 of the species. The dates of capture are recorded the same as in the main list, viz.,—the month in roman and the day in arabic numerals. In preparing this list, I am indebted to Prof. Smith for the list of Culicidæ, and to Messrs. E. Daecke, H. L. Viereck, Charles T. Greene and George M. Greene, for important data.

### MYCETOPHILIDÆ.

- Platyura subterminalis* Say. Lucaston, ix, 2 (Daecke); Riverton, viii, 11.  
*fasciata* Latr.? Lucaston, ix, 2 (Daecke).  
*clausa* Coq., page 263, should read *Ceroplastus clausus* Coq.  
*Mycetophilus vitrea* Coq. Dunnfield, Delaware Water Gap, viii, 12.

### CULICIDÆ.

- Culex sollicitans* Walk. The common mosquito of the coast.  
*tæniorhynchus* Wied. Anglesea, vi, 21; ix, 6 (Smith).

- Culex confinis* Arrib. Delair, vii, 10; New Brunswick, viii, 3 (Smith).  
*perturbans* Walk. S. Orange, vi, 20; Lahaway, viii, 26; Chester, viii, 1-9.  
*canadensis* Theob. Elizabeth, iv, 29; Lahaway, iv, 25; viii, 1-ix, 14; South Orange, vi, 22.  
*melanurus*. Lahaway (Brakeley).  
*sylvestris* Theob. Anglesea, vi, 24; New Brunswick, vii, viii; Chester, viii; Delair, viii, 10-x, 20; Elizabethport, x.  
*reptans* Meig. Chester, x, 10-16.  
*cantans* Meig. Anglesea, Lahaway, New Brunswick, Newark, South Orange, iv, 18-viii.  
*trivittatus* Coq. Chester, ix, 10.  
*salinarius* Cox. (*C. nigritulus* Coq., not Zett.). Newark and Elizabethport, viii, 30-x, 27.  
*restuans* Theob. Anglesea, Lahaway, Delair, Newark, Chester, New Brunswick, vi, 14-xi, 20.  
*territans* Walk. Delair, New Brunswick, Newark, Lahaway, Morristown, Mt. Olive, vi, 1-ix, 21.  
*cantator* Coq. Summit, bred, v, 6 (Holmes); salt-marshes (Prof. Smith).  
*aurifer* Coq. Lahaway (Prof. Smith).  
*dupreei* Coq. New Brunswick (Van Deursen), Great Piece Meadows, Essex Co. (Grossbeck).  
*discolor* Coq. Delair (Prof. Smith).  
*serratus* Theob. New Brunswick, vii, 30, x, 5 (Van Duersen); Great Piece Meadow, ix, 17 (Grossbeck); Cape May Point (Viereck).  
*Anopheles crucians* Wied. Lahaway, x, 8; Cape May, ix, 22 (Viereck); Manumuskin, x, 21 (Daecke).  
*Aedes fuscus* O. S. Delair, iv, 21; Lahaway, v, 1.  
*smithii* Coq. Lahaway, vi, 6-ix, 9. Bred from the pitcher plant.  
*Stegomyia signifera* Coq. Riverton, ix, 8; Delair, ix, 20.  
*Conchyliaestes musicus* Say. New Brunswick, viii, 29; S. Orange, viii, 26.  
*Uranotænia sapphirina* O. S. Lahaway, vii., 20-26 (Harrison).  
*Corethrella brakeleyi* Coq. Lahaway, viii, 3-15.

## CHIRONOMIDÆ

- Orthocladius potitus* Coq. Riverton, viii, 17.  
*platypus* Coq. Dunnfield, Delaware Water Gap, vi, 8.  
*Tanytus bifasciatus* Coq. Riverton, iv, 30.  
*pallens* Coq. Riverton.  
*occidentalis* Coq. Riverton, ix, 14.  
*turpis* Zett. Boonton, iii, 8, 12 (Greene).  
*Chasmatonotus bimaculatus* O. S. Westville, v, 15 (Viereck).  
*Ceratopogon cinctus* Coq. Riverton, x, 9.

- Ceratopogon exilis* Coq. Riverton, x, 9.  
*expositus* Coq. Riverton, vi, 3.  
*johnsoni*, Coq. Riverton, vi, 3.  
*specularis* Coq. Riverton, x, 9.  
*medius* Coq. (MS.). Riverton, viii, 7.  
*mundus* Coq., not Loew, = *C. smithii* Coq.  
*albiventris* Loew, page 628, should read *Chironomus albiventris* Lw.

## PSYCHODIDÆ.

- Psychoda alternata* Say. Cape May, viii, 20 (Viereck). Bred from water.  
*marginalis* Banks. Riverton, v, 14.  
*minuta* Banks. Riverton, ix, 14. Common on trunk of the  
 buttonwood.

## TIPULIDÆ.

- Geranomyia canadensis* Westw. Cape May, ix, 21 (Viereck).  
*Limnophila contempta* O. S. Westville, vii, 21.  
*Trichocera bimacula* Walk. Riverton, xi, 3.  
*brumalis* Fitch. Riverton, xi, 3.  
*Amalopis vernalis* O. S. Lucaston, iv, 14; ix, 28 (Daecke).  
*Tipula flavicans* Fabr. Manumuskin, x, 21 (Daecke).  
*latipennis* Loew. Ocean County.

## BIBIONIDÆ.

- Biblio longipes* Loew. Common at Riverton, x, 20.  
*Dilophus thoracicus* Say. Blackwoods, vi, 8 (Bradley).

## LEPTIDÆ.

- Symphoromyia cinerea* Johnson. Long Branch, vi, 9-12.

## STRATIOMYIDÆ.

- Beris viridis* Say. This is now placed in the genus *Actina*.  
*Ptecticus testaceus* Fabr. should read *P. sackenii* Will.  
*similis* Will., and what were referred to *P. sackenii* on page 638,  
 should be united under *P. trivittatus* Say.  
*Euparyphus tetraspilus* Loew. Boonton, vi, 14 (Greene).  
*Clitellaria subulata* Loew. Riverton, vii, 8.

## TABANIDÆ.

- Chrysops nigrobimbo* Whitney. Jamesburg, vii, 4; Da Costa, vii, 4  
 (Skinner).  
*frigidus* O. S. Dover, vi, 23.  
*Tabanus (Therioptectes) astutus* O. S. Dunnfield, Delaware Water  
 Gap, vii.

- Tabanus (Therioptectes) hinei* Johns. = *T. politus* Johnson, 1890, not Walker, 1871.  
*gracilis* Wied. Da Costa, vii, 20 (Daecke).  
*sodalis* Will., page 642, should read *T. superjumentarius* Whitney.

## ASILIDÆ.

- Leptogaster flavillaceus* Loew. Newark, vi, 14.  
*varipes* Loew. Da Costa, vii, 4 (Daecke).  
*Daulopogon tetragrammus* Loew. Clementon, v, 9; Albion, v, 16 (Daecke).  
*Atomosia sayii* Johnson. Laurel Springs, vii, 12 (Daecke).  
*Dasyllis affinis* Macq. Manumuskin, x, 21 (Daecke); Riverton, x, 20.

## BOMBYLIIDÆ.

- Anthrax lepidota* O. S. Iona, vi, 16 (Daecke).  
*Bombylius mexicanus* Wied. Iona, vi, 8 (Daecke); Riverton, vi, 16; Clementon, v, 30.  
*Phthiria coquilletti* Johnson, Riverton, vii, 4-6, = *P. n. sp.*, Jamesburg, vii, 4, page 949.

## EMPIDIDÆ.

- Hybos reversus* Walk. Jamesburg, vii, 4; Delaware Water Gap, vii, 12.  
*slossonæ* Coq. Buena Vista, vi, 11; Atco, vii, 12.  
*Syndyas polita* Loew. Buena Vista, vi, 11.  
*Empis humilis* Coq. Great Notch, v, 4 (Daecke).  
*Rhamphomyia irregularis* Loew. Riverton, iv, 20.  
*mutabilis* Loew. Clementon, v, 10; Wenonah, v, 14.  
*sordida* Loew. Clementon, v, 10.  
*umbrosa* Loew. Boonton, vi, 6 (Greene).  
*Pachymeria pudica* Loew. Great Notch, v, 4 (Daecke).  
*Litanomyia elongata* Melander. Avalon, vi, 9.  
*Tachydromia brachialis* Melander. Boonton, ix, 9 (Greene).  
*Hemerodromia captus* Coq. Boonton, ix, 5-9 (Greene).  
*Edalea ohioensis* Melander, in place of *O. stigmatella* Zett. ? page 654.

## DOLICHOPODIDÆ.

- Dolichopus ramifer* Loew. Avalon, vii, 22.  
*henshawii* Wheeler. Cape May, vi, 13 (Viereck).  
*Gymnopternus humilis* Loew. Boonton, vi, 2 (Greene).  
*Tachytrechus protervus* Melander = *T. n. sp.*, page 655.  
*binodatus* Loew. Durham Pond, Morris Co., viii, 18 (Geo. M. Greene).  
*Argyra aldrichi* Johnson. Long Branch, vi, 11.  
*Lasiargyra albicans* Loew. Riverton, vi, 15 (Daecke).  
*Hercostomus vetulus* Melander, = *H. n. sp.*, on page 655.  
*Nematoprotus venustus* Melander, Westville, vi, 6, = *N. n. sp.*, on page 656.  
*Hydrophorus viridiflos* Walk. Atlantic City, v, 6.

## SYRPHIDÆ.

- Callicera johnsoni* Hunter. Manumuskin, iv, 28, 1902 (Daecke).  
*Psilota buccata* Macq. Manumuskin iv, 28 (Daecke).  
*Melanostoma kelloggi* Snow, = *Pyrophæna* sp., Delaware Water Gap, vii, 15, on page 659.  
*Pelecocera pergandei* Will. Lucaston, ix, 28 (Daecke).  
*Baccha lugens* Loew. Manumuskin, x, 8 (Daecke). The Atco specimen referred to this species is an immature *Ocyptamus fascipennis*.  
*Myiolepta varipes* Loew. Clementon, vi, 2 (C. T. Greene).  
*Temnostoma bombylans* Fabr. Riverton, iv, 4; Clementon, vi, 2 (C. T. Greene); Long Branch, vi, 9.

## CONOPIDÆ.

- Zodion obliquefasciata* Macq. Riverton, vii, 29, viii, 11.

## PIPUNCULIDÆ.

- Pipunculus nitidiventris* Loew. Riverton, ix, 14.  
*subopacus* Loew. Riverton, vi, 1, vii, 19.  
*houghi* Johnson, should be expunged from the list; see ENT. NEWS, April '03, p. 107.  
*pallipes* Johnson. Wildwood, viii, 27.

## CÆSTRIDÆ.

- Cuterebra horripilum* Clark. Riverton, vii, 6.

## TACHINIDÆ.

- Phoranthia nigrens* v. d. w. Riverton, x, 12, 20.  
*Alophora pulverea* Coq. Riverton, x, 20.  
*diversa* Coq. Riverton, x, 12.  
*Admontia polita* Coq. Lucaston, vi, 27 (Daecke).  
*Clausicella johnsoni* Coq. Riverton, ix, 14.  
*Hyalomyodes triangulifera* Loew. Riverton, ix, 14.  
*Xanthomelana atripennis* Say. Hammonton, vii, 6, 1903 (Daecke).  
*Distichona auriceps* Coq. MS. Belleplain, ix, 8 (Daecke).  
*Siphosturmia rostrata* Coq. Iona, v, 26 (Daecke).  
*Panzeria penitalis* Coq. Riverton, x, 9.  
*Exorista spinipennis* Coq. Anglesea, ix, 1.  
*dorsalis* Coq. Riverton, viii, 25.  
*Euphorocera cinerea* v. d. w. Clementon, iv, 21 (Daecke).  
*Phorocera leucaniæ* Coq. Lucaston, iv, 14 (Daecke).  
*Frontina rubentis* Coq. Clementon, viii, 6.  
*Melopia leucocephala* Rossi. Riverton, viii, 13.

## DEXIIDÆ.

- Thelairodes cinereicollis* v. d. w. Riverton, v, 30.

## ANTHOMYIDÆ.

- Eustalomyia vittipes* Wahlberg. Riverton, iv, 30.  
*Homalomyia manicata* Meig. ? Lucaston, ix, 2 (Daecke).  
*Mydæa pruinosa* Macq. Manumuskin, x, 8 (Daecke) ; Woodbury, vi, 7.  
*Limnophora arcuata* Stein. Riverton, ix, 29 ; Manumuskin, x, 8 (Daecke).  
*Phaonia pallidula* Coq. MS. Delaware Water Gap, vii, 12.  
*Anthomyia latitarsis* Zett. Delaware Water Gap, vii, 15 ; Manumuskin,  
 x, 20 (Daecke).  
*Pegomyia cepetorum* Mead. Atlantic Highlands (Dr. Love).  
*Lispa hispida* Walk. Iona, vi, 8 ; Lucaston, ix, 28 (Daecke).  
*Chirosia capito* Coq. Manumuskin, x, 21 (Daecke).  
*Lispocephala lacteipennis* Zett. Dunnfield, Delaware Water Gap, vii, 15.  
*Eremomyia cylindrica* Stein. Riverton, x, 12.  
*Cænusia substituta* Walk. Iona, vi, 8 (Daecke).

## SCATOMYZIDÆ (SCATOPHAGIDÆ).

- Orthochæta gilvipes* Loew. Manumuskin, iv, 20 (Daecke).  
*Hydromyza confluens* Loew. Boonton, viii (Greene).  
*Cordylura confusa* Loew? Seaside Park, v, 16 (Viereck).

## HELOMYZIDÆ.

- Anorostoma marginata* Loew. Lucaston, v, 30 (Daecke).

## SCIOMYZIDÆ.

- Sciomyza pubera* Loew. Riverton, ix, 29.

## ORTALIDÆ.

- Rivellia brevifasciata* Johns. Atco, vi, 18.  
*Tephronota humilis* Loew, = *T. narytia* Walk. ;  
*Stictocephala vau* (Say), = *Pseudotephritis vau* (Say).  
*Calloptistria annulipes* Macq. Merchantville, viii, 1 (Daecke) ; Boonton,  
 viii, 12 (Greene).  
*Chrysomyza demandata* Fabr. Riverton, ix, 9 ; x, 20.  
*Chætopsis apicalis* Johns. Avalon, vi, 9 ; Sea Isle, vii, 22 ; Anglesea, vii, 16.

## TRYPETIDÆ.

- Tephritis clathrata* Loew. Riverton, vii, 19.  
*fuscata* Fabr. Wildwood, viii, 12 ; Cape May, viii, 1 (Viereck).

## SAPROMYZIDÆ.

- Sapromyza magna* Coq. Avalon, vi, 8 (Viereck).

## HETERONEURIDÆ.

- Heteroneura spectabilis* Loew. Palisades (Daecke).

## SEPSIDÆ.

- Ophthalmomyia bisignata* Coq. Riverton, vii, 4.

## EPHYDRIDÆ.

- Notiphila bella* Loew. Westville, vi, 15.  
*Psilopa fulvipennis* Hine. Cape May, vii, 1 (Viereck).  
*Discocerina magna* Coq. Riverton, viii, 17.  
*Brachydeutera argentata* Walk. Riverton, viii, 3; Cape May, viii, 20 (Viereck).  
*Ephydra subopaca* Loew. Atlantic City, v, 6; Seaside Park, v, 16 (Viereck).  
*Canace snodgrassii* Coq. Atlantic City, v, 6.  
*Hydrellia valida* Loew. Cape May, vi, 4 (Viereck).  
*Parydra quadrituberculata* Loew. Cape May, vi, 4 (Viereck).  
*imitans* Loew. Near Anglesea Junction, vi, 25 (Viereck).  
*Cænia fumosa* Sten. Cape May, ix, 17, at light (Viereck).

## DIOPSIDÆ.

- Sphyracephala brevicornis* Say. Riverton, iv, 14-20.

## DROSOPHILIDÆ.

- Drosophila maculosa* Coq. Riverton, ix, 23.  
*inversa* Walk. Avalon, vi, 8.  
*ordinaria* Coq. MS. Riverton, viii, 4.  
*multipuncta* Loew. Cape May, ix, 23 (Viereck).

## OSINIDÆ.

- Elachiptera formosa* Loew. Riverton, ix, 8.  
*longula* Loew. Clementon, vi, 3.  
*Siphonella inquilina* Coq. Manumuskin, x, 8 (Daecke).

## AGROMYZIDÆ.

- Lobioptera lacteipennis* Loew. Avalon, vi, 9.  
*arcuata* Loew. Riverton, viii, 25; Anglesea, ix, 21; Lucaston, viii, 10 (Daecke).  
*Rhinoessa albula* Loew. Wildwood, viii, 27.

## BORBORIDÆ.

- Borborus geniculatus* Meig. Merchantville, xi, 16 (Daecke); Boonton, iii, 3 (Greene).

## PHORIDÆ.

- Hypocera johnsoni* Brues. Riverton, viii, 31.  
*Aphiochæta epeiræ* Brues. Dunnfield, Delaware Water Gap.  
*flava* Fallen. "N. J."  
*atlantica* Brues. Atco.  
*minuta* Aldr. Boonton, i, 15 (G. M. Green).

All the species referred to the genus *Phora* (Catl., page 698) should now be placed in this genus.

- Conicera atra* Meig. Dunnfield, Delaware Water Gap, vii, 8; Newark, vi, 14.

## A New Roach of the Genus *Chorisonaura* from South Carolina.

BY JAMES A. G. REHN.

*Chorisonaura plocea* \* n. sp.

Type: ♀; Coast of South Carolina. [Collection of Mr. Morgan Hebard, of Chestnut Hill, Philadelphia.]

Apparently closely allied to *C. texensis* Saussure and Zehntner, but differing in the greater number of costal veins of the wings and the rami of the median vein of the tegmina. No close relationship appears to exist with Central American or Mexican types, *texensis* being no doubt the closest ally.

Size small; form elliptical, depressed, surface glabrous. Head exserted, the whole anterior portion projecting beyond the pronotum, rounded; eyes elongate reniform; interocular space great, equal to the length of the eye; antennæ setiferous. Pronotum transverse, elliptical, the anterior portion much more arcuate than the posterior; lateral portions regularly rounded; entire border sub-cingulate. Tegmina sublanceolate, the margins parallel for a considerable distance, apex rather acute-angulate; basal field rather narrow, elongate, not reaching to the middle of the tegmen; costal veins numerous and regularly disposed; rami of the median vein about twelve in number; anal field elongate pyriform, with four distinct veins. Wings elongate; costal margin concave basally, convex toward the apex; appendicular field with the base obtuse-angulate, apex broadly rounded; costal veins about twelve in number, elongate-clavate; medio-discoidal area broad, with ten cross-veins, broader than the medio-ulnar area; ulnar vein without true rami; anal vein biramose. Supra-anal plate transverse, obtuse-angulate, the angle with a narrow triangular incision; cerci elongate-fusiform, depressed, equal to the subgenital plate in length; subgenital plate broad, transverse, apical margin truncate. Femora without distinct spines on the inferior margins, genicular spines present.

General color pale ochre yellow; wings pellucid, with the veins yellowish; disk of the pronotum orange-ochraceous; eyes blackish-brown; abdomen raw sienna, the segments ventrally margined with buff.

### MEASUREMENTS.

Length of head and body, . . . . .	8. mm.
Length of pronotum, . . . . .	2. "
Greatest width of pronotum, . . . . .	3.2 "
Length of tegmina, . . . . .	8.2 "
Greatest width of tegmina, . . . . .	2.9 "
Length of wings, . . . . .	8.5 "
Greatest width of wing, . . . . .	5.5 "
Greatest length of appendicular field, . . . . .	5. "
Greatest width of appendicular field, . . . . .	2.9 "

\* From *πλοκία*, in allusion to the folding of the wing.



## Micro-Lepidoptera—Suggestions.

BY W. D. KEARFOTT.

(Continued from p. 136, Vol. xv, No. 4.)

### *Part III.—Breeding.*

I am quite sure the only reason that every American collector does not increase his collection by breeding from the larvæ is the immense bugaboo he has raised up in his mind of the difficulties, extra work and elaborate cages and apparatus required.

In England and throughout Europe the acquisition of specimens by this method is, if anything, more common than catching the perfect insects with a net. The great majority of species offered through the "Exchange columns" of European magazines state that the specimens are "bred."

The apparatus actually required for the work is absurdly simple,—a few tight tin or zinc boxes and wide-mouth vials for the field and a few common jelly-glasses with tight tin covers or small wide-mouth screw-top jars for the house, are all the apparatus required for a beginning.

It is a mistaken notion of the average collector that larvæ must be raised in cages, with gauze wire on one or more sides to give an abundant supply of air. The amount of air actually required is so infinitesimal that no provision at all need be made for it. A very great advantage of the tightly closed vial or jar is that the leaves or food of the larvæ will retain their freshness and palatability for a week or ten days; whereas, with the wire cage, the leaves are often wilted and stale a few hours after they are placed in it.

The great secret of success is cleanliness, which will be elaborated on later.

For Micro-Lepidoptera larvæ I prefer for actual collecting in the field the screw-top glass vials shown at Fig. 17. Their advantages are that they are light in weight and occupy but little room; several dozen can be carried in the khaki cartridge-bag; they are transparent, and it is easy to select an empty vial or pick out one that contains some particular kind of larva to which we wish to add more specimens, and finally if no further study of the larvæ is required, they can be placed in

racks at home without further attention and used as breeding bottles. I usually carry along a few tin boxes, quarter-pound tobacco or cocoa tins are of a convenient size, to provide for such larvæ as may be found in large numbers, or that feed in such a way that larger receptacles are necessary.

These vials come in several lengths. I use two sizes, one three and a half inches and the other five and a half inches long, both about seven-eighths of an inch diameter.

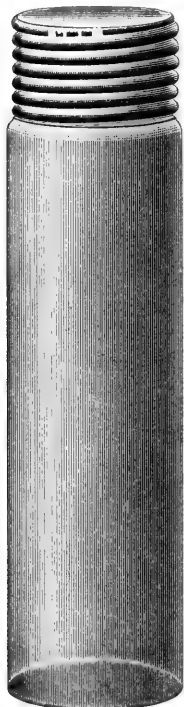


Fig. 17.

It is very convenient, and often avoids the danger of mixing different species, to carry a small pad of paper and pencil, and slip in each bottle as it is put in use a narrow slip with name of food-plant written on it or, if name is not known, some word or two of identification.

The time for collecting larvæ begins when the buds are first swelling and bursting in the very early spring, and can be continued as long as the leaves remain in the fall,—in fact, during the entire winter in the stems of weeds and other plants, in nuts and seeds and many other places,—which latter subject—winter collecting—is another story—for the fall.

But we now have to do with the first spring crop of caterpillars, and will start out together this warm May morning, and see how soon we can get all of our vials and boxes filled, and resolved not to be diverted by a single flying specimen, no matter how attractive it may look. By the quickest route we arrive at the outskirts of the town and avoiding the dense woods, enter a field overgrown with weeds and occasional clumps of higher shrubbery. The first thing to attract attention is the unusual appearance of the young leaves of the wild cherry bushes; instead of being smooth and perfect they are crumpled and twisted into a knot, as if nipped by a late frost; but by carefully pulling apart the

entangled leaflets, a small green larva with a black head will be found in a central cavity, and if we are not very careful he will wriggle away so quickly that he will escape to the ground and be forever lost. We can soon fill a vial with these, breaking off the crumpled leaves only, and carefully avoiding opening them or disturbing the tenants, as it is reasonably sure that if the first one examined is occupied, all others on the same kind of plant and of same general appearance will contain each its larva. A few weeks later the moths that emerge will likely prove to be *Archips rosaceana* Har.

Happening to glance downward, our attention is attracted by the peculiar appearance of some of the leaves of the late purple aster (*Aster patens* Ait.), which at this early season of the year is but a slender stalk twelve to fifteen inches tall, with delicate leaves shaped like a spear or arrow-head; several leaves on each plant have one edge, for the entire length of the leaf, evenly turned up and fastened down, forming a little tunnel open at each end, about an eighth of an inch in diameter, looking almost like the retreat of a small spider.

In some of these tunnels will be found a very pretty larva with head and thoracic segments a deep mahogany brown and the abdominal segments pale green, with a number of narrow dark red stripes on the back and sides running from the thorax to the anal end. We will collect as many of these as possible, as the moth that will come from them is a very beautiful Gelechiid, *Trichotaphe flavocostella* Clem.

Close by is a small pitch-pine sapling. Some of the needles look dead and brown for about half of their length. Let us see what is the reason. A close look, and at the beginning of the discolored part is a small hole, and if we break one off and hold it up to the light, about the center of the brown space will be seen a long dark object that careful dissection of the needle will prove to be a very small larva, that exactly fits the inside of the excavated needle; fifty or more can be comfortably stowed away in one of our vials and, without any attention whatever, will shortly produce a nice crop of *Paratechia pinifoliella* Cham.

Next are some bushes of *Viburnum*, or locally known as

Black-Haw or nanny-goat-berry. A pair of leaves are as evenly fastened together at their edges with silk as if they had been sewed with a needle. Within the comfortable little envelope is a rather fat pale-green larva, ornamented with many shiny dark-brown spots, in due time it will produce a beautiful ash-gray moth, *Anacamptis rhoifruetella* Clem.

On Bayberry bushes nearby, the tips of the twigs and young leaves are gathered together in a small bunch, and if the larva is pale lusterless green with light-brown head, it will probably develop into *Archips persicana* Fitch.

Here is another *Viburnum* bush, but instead of two leaves sewed together, one leaf has its outside edges brought together and then doubled over, just like we would make two folds in a napkin. The larva is bright green with a pale-yellow head. In good season it will develop into a handsome Tortricid—*Exartema permundanum* Clem. Another Tortricid of the same genus, *Exartema zellerianum* Fern., crumples and distorts the young leaves of White Birch in the same manner as the Wild Cherry species first mentioned.

Under an oak tree at the edge of the woods are a goodly number of last season's acorns that seem to have been neglected by the squirrels; we will cut a few open to investigate. Instead of finding them firm and full of meat, we are at first disappointed to see that each contains nothing but dark-brown powdery dust, but stir up this dust a little with blade of pen-knife and a larva is discovered; turn out the contents on the palm of the hand and we shall likely find two, both dull gray, one nearly half an inch long and rather stout, and the other slender and only about a quarter of an inch long. The large one is a beautiful Tortricid, *Mellisopus latiferreanus* Wlsm., bright coppery-red with shining metallic-gold stripes across the wings; the small one is a beautiful little Gelechid, *Holcocera glandulella* Riley.

Just outside of the woods are some dry stalks of last year's Evening Primrose. Mother Nature is never wasteful; so we will see what good purpose these useless-looking sticks are performing in her system of economy. With a sharp knife carefully split one in half, from the flower-head to the root,

and at intervals of a few inches apart, we are not now surprised to find cleanly excavated cells, in each of which is a slender pale-yellow larva. When ready to pupate he will spin a soft white cocoon in his cell and emerge about the last of June: but before spinning the cocoon his instinct tells him that the delicate moth cannot penetrate the thick woody wall of the stalk, so he carefully gnaws a small hole through and then, to keep out evil-minded enemies, he covers the hole with a thin curtain of silk. In his perfect state he is known as *Mompha eloisella* Clem., and a very beautiful object he is, shining pearly white, with red and gold markings.

Nearby is a small Hop-tree (*Ptelea* sp.) with many of its leaves drooping, and in a short time they will shrivel up and drop off. With our now experienced eye, we very quickly discover that a small slender caterpillar has made its home in the stem of each leaf. We will fill up a tin box with a good number of these, cutting the stems off close to the branch and leaving a good supply of both live and wilted food. Within a few weeks we will have a nice crop of *Yponomeuta atomocella* Dyar, a very handsome little moth, with salmon hind wings and the pure white fore wings thickly peppered with black dots.

If this is not sufficient material for one morning's work, we can keep up the hunt, and will soon learn that every species of plant-life supports one or many species of insect-life; we shall also quickly learn that each species of insect has its own peculiar and individual way of twisting or crumpling the leaves, sometimes at the tip of the twig and elsewhere. Some curl the leaves into small cylinders; some cut halfway through the stem and hide in and feed on the rapidly withering leaf, preferring this to green and tender young leaves. Others live in the stems and sapwood, in nuts, flower-heads, seeds and seed-pods, in mushrooms and fungoid growths, on the lichens of trees and rocks; many species are leaf-miners, and as most of us have had an opportunity of finding to our sorrow, one very disagreeable little Tineid will even eat the other specimens in our cabinets.

(To be continued).

# ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

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PHILADELPHIA, PA., MAY, 1904.

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Proceedings of the First General Convention to Consider the Questions Involved in Mosquito Extermination, Brooklyn, 1904. This booklet has just been received and it shows the rapid growth of knowledge in relation to this important subject.

In 1889 Dr. Robert H. Lamborn became greatly interested in the subject of mosquito extermination, and stimulated an interest in the subject by offering prizes for essays along these lines. The essays appeared in book form under the title "Dragonflies *vs.* Mosquitoes. Can the Mosquito Pest be Mitigated?" During the fourteen years since the Lamborn essays there has been an immense gain in knowledge which has accrued mostly from the work of the medical officers in the United States Army during the Spanish-American war. Great good has also come from the efforts of Dr. John B. Smith in New Jersey, who has demonstrated ways and means and carefully explored the possibilities and probabilities for the future, and his survey of the State of New Jersey will be found very valuable to workers in other places. The value of such studies is almost incalculable. A single illustration will suffice. The annual mortality from yellow fever in Havana has been nearly 2000 cases for forty years, or as far back as the record has been kept. At the present time the disease is under control in Havana and the mortality nil or trifling. Malaria and yellow fever have lost their terrors, as we know how to control them, and it is now only a question for municipal or State effort to see that the appropriate measures are carried out or enforced.

## Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS  
OF THE GLOBE.

THE session of the Alstead School of Natural History for this year will open on Wednesday, July 6th. The school is at Alstead Centre, N. H., and the Secretary is Mr. W. S. W. Field, Milton, Mass.

TWO RARE NEUROPTEROID INSECTS.—*Panorpa rufa*, described from Georgia, by G. R. Gray in Griffith's Edition of Curvier's Animal Kingdom (1833), has not been recorded since. Mr. Hine in his revision of the Panorpidæ of the United States, did not have it, and it has been the one species lacking in my collection of this genus. In a collection of neuropteroid insects from North Carolina sent me by Mr. F. Sherman, I find one specimen of this species agreeing exactly with the description even to the four hyaline dots in the apical band. The wings are not as yellow as in *P. americana* and *P. nuptialis*, and I think that the species is more nearly related to *P. subfurcata*. The specimen was taken in Wilmington on Christmas day.

*Mantispa viridis* was described from Florida by Walker in his catalogue. Its green color was so abnormal to the genus that some authors doubted its position. Last year Mrs. Slosson sent me a specimen from Biscayne Bay, Fla., and later Prof. C. F. Baker sent a specimen from Grenada, Nicaragua. It has the green color of a *Chrysopa*, but does not differ in other ways from ordinary *Mantispa*.—N. BANKS.

MÉGACHILE SEXDENTATA Robertson.—Miss Anna Gohrman recently sent me a female *Megachile* collected July 31, 1903, by Karl Schivackheim at Raton, N. M. I was surprised to find that it was *M. sexdentata* Rob., hitherto only known from Illinois. This is an ordinary looking bee, but upon close examination it is seen to have very good specific characters; from its occurrence in Illinois and New Mexico, it may be expected to occur in many States, and collectors should look out for it. Miss Gohrman also sent a couple of species of *Osmia* which she collected on July 4, 1903, at loco flowers at Johnson Park, N. M. They prove to be *O. nigrifrons* Cress. and *O. novomexicana* Ckl., the latter only the second specimen known. The list of New Mexico bees now numbers 511,\* not counting a dozen or more undecided species obtained by Mr. Viereck, and a number of unrecorded and probably new *Colletes*, *Halictus* and *Andrena*, now being studied by Messrs. Swenk, Crawford and Viereck respectively.—T. D. COCKERELL.

CURIOUS HABIT OF TWO ORTALID FLIES.—It has long been known to all collectors that many Ortalid flies have the habit of moving their wings back and forth, sometimes in unison, sometimes alternately, as though

\* The whole of North America (including Central America and West Indies) has about 1882 recorded species. Probably a hundred more have been distinguished as new by Mr. Viereck and others.

taking calisthenic exercises. I have observed two species, however, which have a different habit. These are *Callopietria annulipes* and *Pseudotephritis vau*; the latter has been observed but twice, the former many times. These flies, when at rest, sometimes, turn their wings and raise them directly over the back so that the costal edges touch and the under surface is directed forward. The wings are held vertical, and together make an oval figure. In this position the fly struts around as if to show off. I have seen no reference to this habit, save that Harris in his "Treatise" says "Some of them are in the habit of suddenly raising their wings perpendicularly above their backs, and running along a few steps with them spread like the tail of a peacock," but he does not mention the species. The dipterous genus *Callopietria* is preoccupied several times.—N. BANKS.

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### Doings of Societies.

The February meeting of the Newark [N. J.] Entomological Society was held on the 14th with President Keller in the chair and nineteen members present. Prof. Smith gave a very interesting lecture on classification and synonymy in general and in Lepidoptera in particular. Mr. Edward Kraemer was proposed for membership. OTTO BUCHOLZ, *Secretary*.

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The March meeting of the Newark Entomological Society was held on the 13th with President Keller in the chair and sixteen members present. The members decided to purchase the following publications: A collection of 76 papers on Coleoptera published between 1860 and 1880, by Dr. G. H. Horn. A collection of 109 pages on Coleoptera published between 1845 and 1880, by Dr. J. L. Le Conte, and Holland's Moth Book. Mr. Dickerson read a very interesting paper on the sensitive organs of insects and showed microscopic plates for illustration. Mr. Edward Kraemer was unanimously elected to membership. The gentleman elected to honorary membership in January was not a Mr. Bronson, as published, but Mr. Julius Bunsow. OTTO BUCHOLZ, *Secretary*.

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At the meeting of the Feldman Collecting Social held at the residence of Mr. H. W. Wenzel, 1523 South 13th Street, Philadelphia, March 16th. Ten members were present.

Mr. Harbeck spoke on the use of horse hair for mounting small insects, being used in place of paper slips, etc. The



hair is attached to the pin by shellac into which one end is inserted at a proper height.

Discussed by Messrs. Wenzel and Skinner.

Mr. Daecke exhibited a cell in hickory wood of *Cyllene picta* in which a full grown specimen had been found.

Mr. H. W. Wenzel spoke on the habits and differences of *Cyllene picta* and *robinae*. He also showed his collection of *Buprestis*, which lacks only one American species, the *connexus* of Horn.

Dr. Skinner reported the death of Dr. Hans Herman Behr on March 7, 1904.

Mr. Reinick reported the occurrence of large numbers of winged ants which appeared on March 15th in the building of the Free Library of Philadelphia.

Messrs. Skinner, Wenzel and Harbeck spoke on *Anthrenus varius* and other museum pests.

WILLIAM J. FOX, *Secretary*.

The March meeting of the Entomological Section of the Chicago Academy of Sciences was held Thursday, March 17th, at the John Crerar Library. Eight members present. The report of the Honorary Curator, Mr. A. B. Wolcott, on the condition of the Academy collection was presented. It recited the acquisition by purchase of 600 specimens, 300 species of Diptera all new to the Academy collection. Mr. C. W. Johnson has examined and determined all the Diptera in the collection and these are now in excellent shape. Mr. W. L. Melander did likewise with the Mutillidæ and the type of one of his recently described species is now a part of the collection. The insects which formed the collection of the Chicago Entomological Society, consisting principally of Lepidoptera, Coleoptera and Neuroptera have made quite an addition. Mr. Wolcott has further employed his leisure time in removing from the exhibition cases such species as were required for the study collection and in revising things generally.

Mr. Tower exhibited a list of Rhopalocera taken in the Chicago area which showed a total of 112 species and 7 varieties. There was some discussion on the various systems of

nomenclature in the Rhopalocera, and it was finally agreed that Dr. Skinner's names as given in the new Smith's list would be best to use.

Mr. Tower thereupon proceeded with his talk on color variations in insects as affected by climatic changes. He gave a very interesting resumé of the results achieved by various prominent entomologists in subjecting fresh pupæ of butterflies to freezing temperature, etc., and went more into detail on the experiments he is now conducting with the common potato beetle as a subject. After a little informal talk the meeting adjourned at 9.50 P.M. A. KWIAT, *Recorder*.

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held March 24th, Mr. H. W. Wenzel, Vice-Director, presiding. Thirteen persons were present. Dr. Calvert exhibited a collection of nymphs of Odonata from New Jersey which he had identified for Prof. John B. Smith. The determinations were made from Prof. Needham's keys and descriptions which he had found very satisfactory. Among these specimens were some which agreed with the skin of the nymph from which Mr. H. L. Viereck had reared *Micrathyria berenice* Drury, as mentioned in the NEWS, Vol. xiv, p. 276.

The nymph of this species, hitherto undescribed may be recognized by the following characters. Abdomen somewhat similar in outline, when viewed from above, to that of *Libellula basalis*; without dorsal hooks, their place being taken by a carinate tubercle on each of segments 3-9, this tubercle quite hairy, especially on 6-9; only 8 and 9 with lateral hooks, those on 8 being about one-fifth as long as the mid-dorsal length of 9, those on 9 subequal to the mid-dorsal length of 10, both hooks incurved, those of 9 more strongly. Inferior appendages subequal to the mid-dorsal length of 9, laterals half shorter, superior one-fourth shorter. Eyes quite prominent, reaching back to almost half the length of the head, which last is much narrower behind them. Mental setæ 10-11, the fourth to seventh from outer side longest. Lateral labial setæ 9-10, movable hook almost straight, 11-12 crenulations on the opposing (distal) edges of the lateral labial lobes. Length of the

shed skin 14 mm. Dr. Skinner exhibited what he took to be the larvæ of *Parandra brunnea*. They were infesting a buttonwood tree in Logan Square, Philadelphia, and were present in large numbers. The speaker remarked that he had never seen an imago in the Square. Mr. Wenzel said the imago seldom leaves the tree. He mentioned the fact Mr. Beyer had had taken *Parandra polita* at Norfolk, Va., previously recorded from Texas and Mexico. Mr. Huntington said the Aristotle Society had been fairly successful in getting reports on the Lepidoptera and Coleoptera for the proposed Pennsylvania list. Dr. Calvert said that wings were present in larvæ of both sexes in the Tussock moth, and asked if any one present had noted the fact or had seen any reference thereto.

HENRY SKINNER, *Recorder*.

Minutes of meetings of Brooklyn Entomological Society, Brooklyn, N. Y.

November 6, 1902.—Twenty-two persons present. Prof. John B. Smith, president, in the chair.

Dr. Call reported, for the committee on "Revision of Glossary of Entomological Terms," as to the cost of compiling and publishing 500 copies of a volume containing 125 pages, and after discussion, subscriptions to the extent of \$200 were assured by those present.

Mr. Charles Myers, of Bronx, and Messrs. William Schwenke and Otto Dederer, of Brooklyn, were elected members.

Mr. Martin exhibited specimens collected by himself during the past season at Worms and Bierstadt, Germany. Lepidoptera were numerous. Electric lights were very productive.

Mr. Doll reported his taking of many specimens of a variation of *Eacles imperialis* larvæ in the Catskills which differed structurally from the ordinary type, particularly in the shortening of the spines.

Mr. Pearsall reported his capture of a specimen of *Platarctia hyperborea* on the summit of one of the Catskills.

Mr. Shoemaker stated that he had taken the third known specimen of *Sphinx franckii*, at Washington, this summer, the second having been taken by him several years since.

Mr. Franck remarked that he took the first specimen of this insect in Kansas City many years ago, and that he regarded it as a hybrid between *chersis* and *kalmia*.

Prof. Smith stated that of the seventeen species of mosquitoes indigenous to New Jersey he had bred all but two, and gave portions of the life-history of those which he had studied. The popular description of the "egg-boats" applied only to one species. Other species oviposited in moist peat, etc., where they awaited water for development. Marsh mosquitoes rarely entered dwellings.

General discussion on question as to the period of fertilization, whether fall or spring, of certain hibernating species. It appeared that where both ♂♂ and ♀♀ survive the winter, this occurred in the spring.

December 4, 1902.—Twenty-four persons present. Prof. John B. Smith, president, in the chair.

Prof. Smith, of the Glossary Committee, reported progress.

Mr. Weeks read an article written by his father, the late William J. Weeks, of Suffolk Co., L. I., and published in the *Scientific American* of 1857, offering a solution of the method whereby the honey-bee (*Apis mellifica*) was enabled to construct its cells with more or less regularity,—viz., by the employment of its antennæ as a standard of measure, the identity in length and angle of these organs with the dimensions of the cells having been established by the examination of numerous workers.

Discussion by Dr. Call and Messrs. Roberts, Joutel and Weeks.

Mr. Charles Dury of Cincinnati, made a brief statement of the interest taken in entomological studies in his city,

Prof. Smith exhibited some lantern slides showing a series of notodontian larvæ resting upon their respective food-plants, and also slides illustrating the methods of breeding certain Coccinellids imported from Australia and China and employed in the destruction of scale insects infesting the orange, fig, etc., and lastly slides illustrating scenes in California, obtained during his last visit to that State.

ARCHIBALD C. WEEKS, *Secretary*.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

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## A Case for Schmitt Boxes.

By HENRY L. VIERECK.

(With Plate XIII.)

The first case specially designed to hold Schmitt boxes is shown in the accompanying illustration. This case measures, inside,  $41\frac{1}{4}$  ins. high, 19 ins. wide, and  $13\frac{1}{4}$  ins. deep. It is made of sheet tin folded and soldered together, reinforced by outside ribs, two on the lid and one on each side. Around the outside of the case  $\frac{5}{8}$  in. from the edges is soldered a strip of tin which, with the case, makes a groove  $\frac{5}{8} \times \frac{5}{8}$  in. The groove is lined with sublimated felt or rubber (the former is best because the rubber hardens and becomes useless) and receives the corresponding  $\frac{5}{8} \times \frac{5}{8}$  in. rim of solid zinc on the edge of the lid. Four wire clamps permanently attached to the lid, when clamped over the projecting groove of the case, hold the lid firmly in place so that the case becomes airtight.

Inside the case is placed a wooden frame made of three upright boards, top, bottom and a shelf in the middle, the sides are furnished with cleats that make separate places for the Schmitt boxes.

Each case holds 28 boxes and makes a unit of an elastic

system interchangeable in every way. The case being airtight keeps dust off the boxes and makes them doubly pest proof. What stands in favor of this kind of a case more than anything else is the ease with which it would permit 28 insect boxes to be removed from a building at one time in case of fire—even if not rescued the wooden boxes would be protected to some extent against the fire, on the other hand they could not become water soaked.

We are indebted to Dr. Henry Skinner for this new arrival in the Entomological Museum. Zoologists use, quite extensively, a case that suggested this one, but Dr. Skinner devised the frame for Schmitt boxes and the solid rimmed lid or cover which requires only four clamps, two on each side, while in the old case of the Zoologists there are three clamps on each side and one top and bottom. The cases can be arranged and separated as shown in the illustration, *i. e.*, enough space between the sides to permit the handling of the clamps; the bottom cases need only be separated from the floor by a two-inch plank which will keep the projecting edge clear of the floor; between the upper and lower row of cases another pair of planks is placed to keep the upper case perfectly horizontal and clear of the lower one. The case is now being adopted by two institutions, The Academy of Natural Sciences, Philadelphia, and The Connecticut Agricultural Experiment Station, New Haven, Conn. Mr. E. Daecke uses it in his private collection.

A collection kept in this kind of a case will certainly be pest proof if care is taken that no pest enters boxes that are opened for examination. One case should be fitted with shelves so that an insecticide can reach every part of it, this should then be the quarantine station into which all new material should first be placed for a sufficient length of time, before it is incorporated in the pest free collection.

In this connection we wish to introduce a new device for dividing the insect boxes into columns. We are indebted to Dr. W. E. Britton for this idea. The device is a wire pointed and bent at both ends, and should be of the same material, thickness and color of a Klæger's black pin, No. 6. The wire

should span the box. It is preferable to strips of black paper or ruled lines because it can be shifted at will, and if properly made is always strong and straight. The Schmitt box is usually divided into four columns running from back to front.

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### Some Remarks on Classification.\*

BY JOHN B. SMITH, SC.D.

Whenever there is a new list in any order, whether the time between lists be long or short, there is an outcry against changes; a feeling of irritation and disgust because of the necessity of learning new names and rearranging cabinets. And that is not the least of it: old species meet us under unfamiliar names, not only generic but specific; while well-known generic names are used in a way that brings despair to the older men with the habits of a lifetime to unlearn.

Lepidopterists have had of recent date no less than four distinct shocks. For ten years there had been peace, and everybody had gotten used to the list edited by me in 1891. That list, prepared with the co-operation of special students in the leading families, fairly represented the then generally accepted classification, save that more family divisions were recognized. It was realized that the order of families was not a natural one, and that there was no uniformity in the value of the divisions. It was a check-list and little more.

In 1902 Dr. Harrison G. Dyar published in Bulletin No. 52 of the U. S. National Museum "A List of North American Lepidoptera and Key to the Literature of this Order of Insects." This was revolutionary in character, and expressed the views of the author on classification and on synonymy. While much of this scheme of classification was original with Dr. Dyar, it was not all presented for the first time and, within family limits, the arrangement and synonymy expressed the views of his collaborateurs. But it was the first time the scheme was presented as a whole to the lepidopterists of the country and they

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\* Read at the annual meeting of the Brooklyn Entomological Society as a Presidential address.

were lost in its mazes. The list as it stands is a useful piece of work, wonderfully accurate for its extent, and as a whole based upon what I believe to be a natural system. To one familiar with the literature, the specific index is enough to locate the species, but the absence of generic synonymy, of all reference to the description of synonyms, and the perhaps unavoidable brevity of the references generally, left the average collector helpless before a sea of unfamiliar names arranged in unfamiliar order without any point of attachment to his previous guides. In certain series, notably the butterflies, the generic divisions were at variance with those generally accepted by American students, and were adopted from Scudder without renewed or original study by Dr. Dyar. Some of the arrangements and synonymy in the Noctuidæ did not agree with my own views in the matter and, after some consultations, a new edition of the check-list of 1891 was determined upon.

In this, Dr. Dyar's general scheme of classification was accepted with some modifications; but not the synonymy, generic or specific, which was more closely approximated to the old list. While many changes were necessary they were, so far as possible, indexed to the previous list, that with some little labor the possessor of the old list could find nearly all its species in the new edition.

Hardly had the new list been generally distributed before Sir George F. Hampson's volume of the first series of the Noctuidæ appeared, and this complicated matters further. It was inevitable that, when the described species of all faunal regions were collated, many generic and some specific synonyms should be found. It was also inevitable that, viewing generic bases from a somewhat different standpoint, there should be some divisions of described genera and some combinations, resulting again in an aggregation differing radically from the two lists previously mentioned. Some genera get new types,—*i. e.*, other species than such as have been heretofore accepted,—and the order of genera is completely changed. *Noctua* is now used for what we have called *Erebus*, and other well-known names disappear completely.

Most recent of all is Dr. W. J. Holland's *Moth Book*, in



which the nomenclature of the Sphingidæ is based upon the work of Rothschild and Hartley. We are here asked to forget all our previous associations of names and structure and to learn a totally new combination. *Sphinx* is no longer typified by species resembling *chersis*; it is now applied in the sense in which we have previously used *Smerinthus*. *Sesia* is no longer a clear-wing; but its representatives are our species of *Ællopos*,—and so on.

We have heard of discussions concerning the "whichness of the what," or the "thusness of the that," and have considered them as jokes; but the state of uncertainty at present existing as to our lepidopterological nomenclature is no joke at all.

The question naturally arises,—what causes all these differences of opinion, and why are such changes necessary? Before pointing out some of the difficulties, I want to record a little conversation had with one of the authorities in another order, wonderfully familiar with the literature in his own as well as other specialties. He cited a recent work in which the author proves to demonstration that a particular species must be the type of a given genus. There seemed no escape from the conclusions of the publication until, a little later, another was issued by another author who was equally convincing in his proof that a totally different species was the type of the generic name.

Of course this aroused interest, and my friend concluded that, as he had all the publications referred to, he would look the matter up himself. He did so, and concluded that neither of the previous writers was correct; but that an altogether different species must be considered as the type! Now here we have three authorities, with exactly the same evidence before them, coming to three distinct conclusions; and each is firmly convinced that he is right.

How does it happen, then, that so much difference of opinion is possible when the evidence is all before us?

When Linnæus first used his binomial system definitely, in the tenth edition of the *Systema Natura*, which is accepted as a starting point for our nomenclature, he used the terms *Papilio* for all butterflies; *Sphinx* for all hawk-moths and some other

things; *Bombyx* for spinners and the like; *Noctua* for owlet moths, etc., all his generic names being now used with family terminations.

Linné did not, of course, express any generic type, and his descriptions were as general as the species under them were various.

Following Linné, came Fabricius and, while he was yet writing, Scopoli, Laspeyres, Latreille and others.

Each of these authors used the Linnæan names and added new ones: and they differed a little in their application of the terms. Now here comes the first chance for a disagreement. Some authors hold that the first specific name under a genus must be held to be its type and, because Linné placed *ocellata* at the head of his list of *Sphinx*, that species must be the representative of that generic name forever. Other authors claim that when a generic term is used, all the species under it are equally representative and, unless the author has in some way indicated a particular species, a subsequent student has the right to divide the genus as he wishes, and may confine or restrict the original term in any way that he chooses. In 1805, Latreille described *Smerinthus* and used it for Linné's first group of *Sphinx*, including in it *ocellata*. If Latreille had the right to do that, *ocellata* was no longer a *Sphinx* and could not serve as the type of the genus. Here, then, we have two schools at once,—in one of which *ocellata* is a *Sphinx*, in the other of which it is a *Smerinthus*.

In 1775, Fabricius proposed the term *Sesia* for our *tantalus* for the clear-winged *Hemaris*, etc., and included in the term also the little species now called *Sesiidæ* in our list. For those of the first-named school *tantalus* is and ever must be the type of *Sesia*.

But in 1777, Scopoli separated off *stellatarum* and allies as *Macroglossa* and, in 1801, Laspeyres in a general work restricted the term *Sesia* to *tipuliformis* and its allies. These changes and restrictions have heretofore met with general acceptance, and I must confess that personally I cannot follow Messrs. Rothschild and Hartley in making the changes they adopt in our nomenclature.

Hübner began to write in 1793, or thereabouts, and in 1806 published the celebrated "Tentamen," a very suggestive classification of the Lepidoptera in which a number of new names were proposed, with each of which a known specific name was associated. There were no descriptions, no explanations, only names; suggestive enough to one who knew, absolutely unmeaning to all others.

Here we come to another opportunity for disagreement. One school holds that each new name being associated with a known species, that species thereby became the type, and this was all that was needed. The other maintains that such a term is a *nomen nudum*, a naked name to which no definite meaning is attachable. As a number of authors, including Ochsenheimer, were then writing, it becomes a question of some importance to fix the status of the "Tentamen." Hampson ignores it. Dyar accepts it. So we have an added opportunity for differences in generic terms, and there is nobody that has authority to settle the differences. Some authors, including myself, recognize secondary sexual characters as sufficient for generic separation,—*i. e.*, a series of species with pectinated antennæ in the male may be generically separated from a series in which these appendages are simple in both sexes. Hampson and others hold that such characters should not be used, but that a genus should be equally recognizable in both sexes. I rather sympathize with that view of the case; but the result of its adoption gives us horribly unwieldy genera, and as genera are for convenience of classification only, I have deemed it best to admit the use of characters peculiar to one sex only. I remember I told Dr. G. H. Horn, many years ago, that in my opinion there should not be genera which could be determined from one sex only. His reply was, "Until you know both sexes you do not know the species, and when once you know the species there is no difficulty in recognizing the genus." I have kept this point in mind ever since, and it really decided me in favor of the practice that I have adopted.

The important feature here is that by this difference of opinion Hampson's work differs from mine in certain generic divisions and, so long as we continue to differ, the same specific name may appear under different generic terms.

It happened occasionally that a peculiarly fitting term was applied in different orders of the insects, in a different class of the Animal Kingdom and even in the Plant Kingdom. When that was the case the term stood for its earliest use, and the later or preoccupied name fell; anybody could propose a substitute. As descriptions multiplied, this became a troublesome matter, and it was finally agreed that a term might be used in both Animal and Plant Kingdoms; but only once in each.

As specialization increased, men confined their studies to one class and, in the insects, to single orders; the literature increasing in proportion to the number of students. Furthermore, as new territories were settled and explored, investigators limited their work—often of necessity—to one faunal region, and the entomologist in central North America had little chance of knowing what was done by the conchologist in central India. So further duplications took place, and the same name was used in different classes and in different orders. It is technically allowable for anyone who discovers that a generic name is preoccupied anywhere in the Animal Kingdom to propose a new one, and it is a cheap way of satisfying a *mihi* itch at the expense of one who has done real work, but has not had access to literature. Personally I never change a name unless it is preoccupied in another order, and I have been slow in recognizing changes made because a name was preoccupied in another class. Practice varies, too, as to what names may be changed: whether they must merely sound alike, have only the same derivation, or must be literally alike. Lord Walsingham, for instance, would consider *Sesia* and *Setia* alike, because he pronounces them so; but to one who gives the *t* its value this seems absurd. Some claim that the hard *C* and *K* are the same, and that *Cobalos* and *Kobalos* are duplicates, though with a differing initial,

All these points are factors which afford opportunities for disagreement, resulting in differences of generic or specific names used. To some the letter is of more importance than the spirit, and that a change made on a technicality upsets a century of general acceptance and use matters not in the least; in fact it seems rather a delight to them to replace a name in

general use by some term long since abandoned or lost sight of, if a possible excuse can be found for it. Sometimes a question arises whether a wrongly written or printed name may be changed if it thereby becomes a synonym.

It is literally a case of many men many minds, and to the collector, without the basis for an opinion or a knowledge of why things are done, all seems chaos, and he simply follows whatever list he has or whatever authority has his confidence. I quote from a recent number of the *Ent. Record and Journal* on "Variation."

"The average collector \* \* \* \* does not care a dead mite for priority fancies. He asks for uniformity at any price, and in the existing welter of opinions, will not bother his head about who misspelled a name first and stuck to it, and who dared to correct the printer's blunder, or started a system of his own, necessitating a host of new divisions and subdivisions,—all intensely interesting to the scientist, but actually repugnant to the field naturalist and the 'mere collector,' for whom the rose smells as sweet whether it be called a rose or redescribed as var. William-Allen-Richardsonii."

While what I have said has been in comment on recent work in Lepidoptera, it applies in principle to other orders also, and there are some in which there are differences of opinion quite as great.

Now I admit to a little conservatism in some directions; I don't mind smashing things where I think they deserve it and, of course, I admit everybody else to the same privilege; but it seems to me that there is a difference between an attempt to correct a supposed error of observation or interpretation of structure and an attempt to change names only.

Classification is, after all, only a scaffolding upon which we hang our knowledge, and names and divisions are mere pegs to indicate the combination for which they stand. Every time we change the combination indicated by the peg we disturb the system. What injustice is done to Linné by using *chersis* rather than *ocellata* as the type of *Sphinx*, and why should not Latreille receive recognition for his limitation of the broad term, and credit for the new term proposed by him?

The ornithologists have tried to regulate cases of this kind, and Canon XXI of their code reads, "When no type is clearly indicated, the author who first subdivides a genus may restrict the original name to such part of it as he may judge advisable, and such assignment shall not be subject to subsequent modification."

This seems in accord with justice and common sense, and this rule has been generally observed by American authors. I am sorry that Dr. Holland has accepted a nomenclature in conflict with it, because personally I shall not feel able to accept the changes.

There is only one real entity in nature, and that is the individual. No two specimens are exactly alike, however much they resemble each other. Each has a combination of characters peculiar to itself and which it may transmit to its progeny, in whole or in part, or with some modifications. An aggregation of individuals which mate freely and produce fertile young is a species, and most species may also be considered as natural divisions. Individual variation does not go beyond a limited range, and it nowhere touches or encroaches upon the range of another species. But, while this is true in general, there are exceptions, indicating that the process of species-making is yet a part of Nature's evolution. This, however, forms a topic too large for an address of this kind.

When we leave the species, Nature places no restriction upon the systematist. He can make genera, families, superfamilies, and orders as he pleases, and may base them upon any characters that seem good to him.

It may be possible some day for entomologists to reach some common ground upon which all may and will stand; but the present is a stiff-necked generation, of which every individual believes that he is pretty nearly right, and I am not counting upon the arrival of the happy day in my lifetime.

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THE tick mentioned in ENT. NEWS, Vol. XIV, p. 212, has been kept in the small turned wooden box with a tight-fitting lid, and has not had any food or water. The box has been kept in a roll-top desk, closed at nights. At this date, May 1st, the tick is alive and hearty, and is now nearly two years old.—H. SKINNER.

## A new Californian species of *Dromaeolus* Kies.

BY FREDERICK BLANCHARD, Tyngsboro, Mass.

***Dromaeolus hospitalis*** n. sp.—Form elongate, nearly parallel, narrowed at apical third, black rather shining, prothorax dull, with short brown pubescence inclining to yellowish at sides of elytra near the base. Antennæ dark piceous or black, somewhat brownish apically, slender, filiform, slightly longer than the hind angles of the prothorax, first joint more or less evidently carinate its whole length on the lower side, second a little longer than the fourth, third about equal to the next two which are short, subequal, joints six to ten longer, subequal, the eleventh nearly as long as the two preceding; head convex, densely punctured, with a fine median smooth line more or less evident especially in front; prothorax as broad as long in the female, or slightly longer than broad in the male, and as wide as the base of the elytra, sides straight, parallel, arcuately narrowed at apical third, disc moderately convex, median line strongly impressed at base and reaching the middle, or even feebly continued to apex, surface densely rugosely punctate, less densely on the disc from middle to apex, more densely at the sides; elytra substriate, finely, not closely punctate, the punctures a little coarser at base; beneath, the prosternum and sides of metatarsum rather strongly not closely punctate, propleura more coarsely and closely punctate, the punctures extending quite to the lateral margin posteriorly, obscuring the antennal groove; hind coxæ and abdomen more finely and closely punctate, anal segment more coarsely and very densely and roughly punctate at apex; metasternum with a fine smooth line at middle; triangle of the propleura not twice as long as wide at base, the antennal groove strongly impressed anteriorly, not distinctly limited externally and obsolete behind; legs black, tarsi brown, the fourth joint of the latter as wide as the third and distinctly emarginate above receiving the base of the fifth joint. Length 7-10 mm.

The foregoing description follows very closely that given by Dr. Horn, in his Monograph, of *D. basalis* Lec. In his synoptic table Dr. Horn defines *nitens* and *basalis* by the "marginal grooves of thorax shallow, not sharply limited internally." In all three species the antennal grooves are deep anteriorly, rapidly shallowing behind. They are best defined in *nitens*. In *basalis* the internal limit is evident, though feeble. In *hospitalis* it quite disappears, the coarse punctures encroaching upon the very shallow continuation of the groove behind. The general appearance of *nitens* is more shining, the pubescence being distinctly fine and the prothoracic punctures less close upon the disc, although dense and rugose at the sides, much as in the other two species. The anal segment is similarly densely

punctate at apex in *nitens*, and the fourth joint of the tarsi is as wide as the third. The prothorax in *basalis* is apt to be a little wider than the elytra, with the sides feebly arcuate and, by comparison, a little less densely punctate and rugose than in the new species. The punctuation beneath is finer, especially upon the abdomen; the anal segment scarcely different from the others. The fourth joint of the tarsi is very small, feebly impressed and distinctly narrower than the third. The distinct cinereous pubescence at base of the elytra in *basalis* is slightly tinted in the present species by a few paler hairs at the sides of base. The character noted by Dr. Horn,—triangle of prosternal parapleura twice longer than wide in *nitens* and less than twice as long as wide in *basalis*,—is rather difficult to appreciate. The present species, while partaking somewhat of the characters of both *nitens* and *basalis*, does not appear to be intermediate. It might be placed after *basalis* because of the still more feebly defined antennal grooves, although by its general form and its tarsi it more resembles *nitens*.

Mr. L. E. Ricksecker, of Santa Rosa, Cal., July 7, 1897, obtained many specimens of *hospitalis* and *nitens* at the same time from a decayed Alder stump, "that had presumably been floated down Russian river during some freshet, and deposited a few miles below the mouth of the river on Wright's beach." Mr. Chas. Fuchs, of San Francisco, has submitted one specimen from "Boulder Creek, Santa Cruz Co., July 5, 1895."

**Dromæolus californicus** Bonv.—This species has a short, deep impression or groove on the median line of the metasternum.

Mr. Ricksecker has taken the species from decaying stumps of the Douglas spruce at Sylvania, "May 17, 1900."

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THE EGGS OF *KERMES GILLETTEI* Cockerell (family Coccidæ).—Newstead cites as the maximum number of larvæ from one female Coccid 6258, from *Walkeriana pertinax* Newst., found in Africa.

Upon examination, I found a female of *Kermes gillettei*, collected by Mr. Cockerell at Manitou, Colo., to contain 6676 eggs. The eggs are an opaque white color, and in form long oval, measuring 120 to 135  $\mu$  in width and 220 to 244  $\mu$  in length.—L. C. HIMEBAUGH, Biology Dep't, Colorado College.



**Attelabus bipustulatus Fab.**

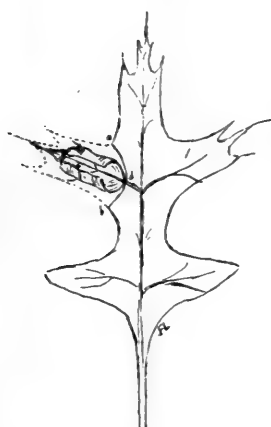
(COLEOPTERA.)

**Theory of Oviposition and Construction of Nidus; Miscellaneous Notes.**

BY A. ARSENE GIRAULT, Blacksburg, Va.

May 18.—Many egg-cases found on different species of Oak (*Q. rubra*, *nigrum*, *alba*). Most of them have been hanging for some time, being browned and brittle; a few under construction. Eggs present.

*I.—General method of construction of nidus, with observations showing method followed for different oak types.*



♀ simply makes a crescentic, smooth-edged incision along margin of the leaf; this incision extends from a point on the margin on each side of one of the principal veins from the midrib, to this vein, the latter thus continuing through the section cut out, forming a petiole for the nidus after construction (*vide* figure). It is now obvious that the nidus is formed from the portion of the leaf separated out by this crescentic incision; the separated section is simply rolled up.

*1. First method of construction and oviposition. Q. rubra.*

May 22—*rubra*.

(a) *Construction of nidus.*

After cutting out section of leaf, as shown in foregoing, the female crawls slowly up and down the midrib of the section on the under side and creases the leaf, using its legs as levers, biting afterwards with its jaws to keep the crease in place. It repeatedly folds the section face to face in this manner,—*i. e.*, by sprawling the legs on each side, apart and over the midrib, and then bringing them together, generally using the legs on one side of the body as a force, the corresponding opposite ones as a base against which the force is applied. (Analogous to the thumb and fingers. Imagine a leaf held, face out, petiole down, between the thumb and fingers, so that the midrib is equidistant between the base (thumb) and the force (fingers); now if the leaf is folded so that the two upper faces are approximate, the midrib forming the line of creasage, or the hinge, it exactly illustrates the relative position of the dextral and sinistral series of legs.)

It continues the creasing, going up and down the midrib of the section until the two upper faces are *approximate*. Then it makes diagonal creases from the midrib, crawling slowly with the beak applied to the

EXPLANATION OF PLATE.—Leaf of *Q. rubrum*, showing at *ab* incision made by beetle; the shriveled section isolated, and the natural outlines (the dotted lines) of the section from which the nidus is made; the vein *d* forms the petiole of the nidus.—ORIG.

surface of the leaf as if actually creasing with the beak. (This could not be determined because of the movements of the leaf in the wind. It does, however, bite the crease after formed. Analogue: pinching a piece of paper after folding.) Two diagonal creases are made, one on each side; another short, transverse, deeper one is made at the edge of the leaf on one side near the base.

After the leaf is creased, and the faces are *approximate*, the slender tip is folded over against the faces, and the fold or joint twisted. Then, by turning in one end of the section obliquely, tucking in the while, the section is nicely and neatly rolled into the nidus, the base perfect, and the slender tip peeking from the apical end. The tip is afterward tucked in carefully, some time being given to the process.

(b) *Oviposition.*

Oviposition then takes place:

- (1) in the rolled tip before tucked in, the more probable, or
- (2) in the rolled tip after tucked in.

Finally, the beetle comes to the small petiole, or portion of the vein connecting the section with the main leaf, slight enough already as a support for the nidus. This is cut in such a manner that the case will fall in a short time from natural causes. In one case the beetle returned after a short while, and wrapping one of its cephalic and one of its intermediate legs around the petiole, snapped the connection, the nidus rolling to the ground. An egg was found concealed within the twisted tip.

2. *Second method of construction and oviposition. Q. nigrum. Q. alba.*

June 1—*nigrum*.

(a) *Construction of nidus.*

♀ simply folded the section of leaf face to face, the midrib forming the hinge. Differs from the first method in that the two (2) faces were not *approximate*, but *flat* together, the case being made by rolling up the leaf section after it has been folded *flatly* in halves.

This species of oak has no tapering apexes, and thus no projecting end in which to lay the egg.

(b) *Oviposition.*

After it has rolled up a small portion of the section, in a crevice formed by the folds the egg is laid. The section is then rolled completely up, enveloping the egg within its folds. Analogue: rolling up a strip of carpet and placing a tack on it after a portion has been rolled, and then continuing the process.)

June 23—*alba*.

(a) *Construction of nidus.*

The method given in foregoing (June 1, *nigrum*) seems to have been carried out in at least a majority of cases coming under observation.

(b) *Oviposition.*

Similar to that given under *nigrum*.

II.—*Classificatory outline, showing theory of nidus construction and oviposition; summary.*

It seems probable and possible, from the foregoing, that the method of constructing the nidus varies according to the species of oak and the two main leaf types represented by these species. Those made from *Q. rubra*, and species of the same group, are probably constructed as under the first method; indicated both by observation and by old cases. While those on *nigrum* and species of the *nigrum* group including *alba*, with broad tipped leaves, are constructed as given under the second method of construction, flatly; evidence by the cases found on the ground under these oaks, and also by observation. These points need further investigation.

1. Type: *rubra*, group of *Quercus*, including all species with acute or slenderly tipped leaves, as in *rubra*, etc.

(a) *Construction of nidus.*

Section cut as usual; leaf faces *approximate*, rolled obliquely with slender tip projecting.

(b) *Oviposition.*

In the projecting slender tip after rolling:

(1) before tucked in, more probable;

(2) after tucked in.

2. Type: *nigrum*, group of *Quercus*, including all species with obtuse leaves, as in *nigrum*, *alba*, etc.

(a) *Construction of nidus.*

Section cut as usual; leaf faces *flat*, rolled in the same straight line.

(b) *Oviposition.*

In crevice of partly rolled nidus.

Hence, construction of nidus depends on shape of leaf, which depends on *group* of *Quercus*; and oviposition varies directly with the method of construction.

III.—*Miscellaneous Notes.*

(a) *On time of construction and oviposition; from a single observation.*

Incision . . . .	30 minutes. (?)
Creasing . . . .	15 "
Rolling . . . .	9 "
Oviposition . . . .	6 "
	<hr style="width: 10%; margin-left: 0;"/>
	60 "

(b) *On habits.*

The adults eat small, round holes from both surfaces of the leaf. They are not easily disturbed, and do not readily "play 'possum," as do the *Curculios*, but apparently have to be forced to do so. When they do, it is not done half so well, nor is it so real nor as lengthy, as with the *Curculionidæ*. It is much more of a sham and requires no loss of patience to the observer, for it is no sooner done than over with.

The females apparently live for quite a period of time, and do all of the work on the nidus excepting perhaps during the early part of their lives as adults, when the males may occasionally condescend to help them. On May 18th the two sexes were observed together, the male on the female's back taking no part in the work. After that date the males began to disappear; none were observed taking actual part in the work.

At times the females have much trouble in making the nidi, and many abandoned ones have been found; several cases have been found side-by-side, probably deserted by the same individual. Most of the trouble lies in the cutting out of the leaf section, in the selection of a wrong portion of the leaf, and making the crescentic incision in the wrong place before the mistake is discovered; or, in other words, faulty instinct comes into play. As many as three (3) nidi have been found on a single leaf.

(c) *On period of oviposition; May 18th-June 23d.*

The period of oviposition is quite long, covering perhaps six (6) weeks, three in May and three in June; the dates given are those recorded from observation, the last one (June 23d) based on the fact that a female was observed constructing a nidus, and hence more or less doubtful. I noted on June 2d that they were still ovipositing, on June 4th that but a single individual was seen, and that the period of oviposition was probably at an end; the next date (June 23d) records the fact just stated in regard to female making egg-case, and on June 24th the last beetle was observed, then thought to be the forerunner of an overlapping second brood, but evidently a straggler. Hence, the period of oviposition extended practically to June 4th, theoretically to June 23d.

(d) *On development; larvæ, nidi.*

June 2d—Eggs found in all cases examined; no larvæ.

June 4th—Most of the nidi have fallen to the earth, and have begun to decay. They are easily found lying amongst the grass, and were numerous. Not a single larva found in ten (10) examined. Many of the nidi were partly unrolled, due to moisture; others fresh and newly fallen; majority old and brown. They hang to the tree for several days, perhaps a guard against too much moisture.

June 12th—Two larvæ found in many cases examined; eggs about to hatch, abundant. The cases containing larvæ were full of frass and other evidences that they were feeding from interior portions.

June 23d—Several cases examined this morning, finding indications of the presence of larvæ. At last a nearly full-grown larva was found in

one, the case being reduced to a mere shell, the larvæ filling the whole of it; lost. After this, several younger and much smaller larvæ were found.

June 24th—Larvæ, a single egg, and adults found to-day; pupæ perhaps also present. The last adult observed. Attempts to obtain pupæ a failure.

*Annapolis, Md., 1901.*

May 7th—Cases and eggs abundant, also adults; cases measure about 5 mm.

May 20th—Larva obtained from cases in stage.

May 30th—Oviposition continues; fresh eggs present. Find great difficulty in attempts to rear. Very young larvæ present; no pupæ obtained.

The egg is probably laid before the case is rolled up, although one examined when partially rolled and under construction yielded no egg. (*Q. rubra?*)

Credit is due Mr. John F. Strauss, Washington, D. C., for the rough draft of the figure, and to Mr. J. Francis Linthicum, Annapolis, Md., for recopying.

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## Relation of the Systematic to the Economic Entomologist.

BY F. M. WEBSTER, Urbana, Ill.

I go to my farm in spring, and my tenant points out to me a young colt frisking about beside its mother. Five or six years after I observe him working a horse in harness at the plow, and I ask him where he obtained his horse; and he tells me that it is the colt that I saw besides its mother some years before, except that it has now developed to a horse. I ask him when the colt ceased to be a colt and became a horse, and he cannot tell me, though he has probably cared for it and watched over it nearly every day since its birth; yet, despite all of this, he cannot give me the exact date when the colt became the horse. He has given me an honest answer, and I do not think less of him for having done so.

My children grow up to manhood and womanhood, and I ask the mother when they ceased to be boys and girls and became men and women, but she can not tell me. We know that, legally, they reached maturity at 21 and 18 years of age, but we also know that some children are more mature at the age

of 16 or 18 than others are at 25, and no law in christendom can change these conditions.

I go to the entomologist who describes species and ask him what constitutes a species or a genus, and he honestly informs me that he does not know and cannot therefore tell me. Why should I wonder? We are dealing with ready-made problems, involving organisms over which we have not the least control, and of which we really know but very little. Animal life in general, and insects in particular, possess an almost unlimited capacity for adaptation to changed conditions, but they did not obtain these advantages by any skillfully planned effort of their own. They have varied in the past, are varying at present, and will continue to vary in future, according as their environment is unsuitable; not because they set out to do so, but because they cannot help it. If we wish proof of the fact that insects, of all animal life, are the most susceptible to variations of environment, we have but to consider their countless number of different forms, intergrading into each other on the one hand and away from each other on the opposite. Where, in its evolution from the stem, does it cease to be the one species and become another and independent species? Until we learn this we cannot establish a fixed law that shall regulate the extent to which a species may vary, but must leave this important duty to the individual describing it; and as humans vary as much mentally as they do physically, and labor under different environments, the way out of our dilemma does not appear at all easy. I have in other papers compared the describer of species to a pioneer, because his work must come first. It is he that must bridge the chasm confronting the morphologist. Until a form is described, we cannot well indicate it and refer to it clearly and distinctly, and, unless it is given a name, we cannot do this without each time repeating the description. This is all there is in a description or a name, and when the systematist has done this, his work is ended. Beyond this, he lays aside the systematist and becomes the morphologist. He has built the bridge; whether it is perfect or faulty, whether it is safe or dangerous, is a matter that those who are to use it must settle. If a description does not describe a species, or if a name does not designate a species

from some other one, of what use is either to those who must use them in the advancement of knowledge? The man who crosses the bridge is not to blame if it proves inadequate for the purpose for which it was constructed. He is simply striving to advance; the structure does not meet the requirement.

The morphologist does not care who describes and names a form; whether he is old or young, rich or poor, a catholic, a protestant or a jew; what he wants is truth, and he is compelled to have this before he can go on with his investigations. The systematist who helps him is a benefactor, for he is reaching out in every direction for assistance.

Let me return to my illustration of the bridge. An army, which you may term morphologists, if you choose, is encamped on the bank of a river which it must cross before it can accomplish the end for which it was brought into existence. There are no bridges and the flood is deep and the current swift. The pioneer corps sets to work to construct the bridges, but the engineers disagree as to the proper location, some claiming that an old structure was reared a century or so before and the old abutments are safe and should be utilized, while another faction disputes this and says the abutments have become unsafe, and another location is preferable, while a third faction favors a different structure, in a different place, each insisting that they and they only are right. Construction begins, but the builders disagree as to the method of doing the work and in the material to be used; one faction puts in place and another pulls down; sometimes one faction has one end of a girder or timber and another faction has equally strong hold of the other end and both pull in opposite directions. They sometimes accuse each other of defects, both mental and moral, until the morphologist becomes discouraged. You say that a good commander would remove half of the corps and let the remainder proceed: but which half, please? The army wishes to get across; if the construction corps is weakened it will be long delayed. Half the work being done is useless and half the workers are simply in the way of the other half, while the army is idle and, to an extent, helpless.

Now, I have drawn you a picture. It is not a pleasant one to look upon, but it is lifelike and up to date. Entomology

is advancing in this country by leaps and bounds, but it is not the advance of a well-drilled army but more like that of untrained recruits, whose object may be the very best, but in their enthusiasm and zeal they get in each other's way. It is said that in the far west, if a bunch of mules are beset by wolves, they collect together in a circle, heads inward, and kick outward toward their enemies; but sometimes systematists reverse the position and kick each other. The fact is, no one willingly obstructs the progress of his fellow; but entomological nomenclature has driven more than one good student to other sciences, where these difficulties are reduced to the minimum.

The one who describes a new species, that *is* new and not a mere trivial variation of an old and well-known one, has done the world of science a direct favor that will live and grow after he has himself passed away; but if he has only happened upon an individual with one more or one less puncture than one already described, or of a shade different color, or with a few more or a few less hairs, though the habits be the same, and describes this with a long name and publishes his work with a flourish of trumpets, he has simply gotten in somebody's way, and his work will continue an obstruction long after he has been otherwise forgotten. It seems to me, in this day and in the present stage of progress, the systematist might, without serious injury to the cause, vary that well-remembered adage to "be sure he is right, and then"—look again! When the undescribed material began to dwindle away, as it has in some groups, it was to be hoped that those who must continue to write descriptions would turn to a more careful examination of the things themselves, and study nature by the comparison of different species, using the insects themselves for comparison. But the current has seemingly turned in another direction, and in this advanced age insects themselves are no longer essential, as with a supply of old musty descriptions, written when it was impossible to work as accurately as at present, species and genera galore can be made and unmade without the trials and tribulations of the collector being experienced at all. And the fine points of literary distinctions that are brought into active



service remind me of the young lady who insisted that it was not at all appropriate to go out *buggy*-riding with anybody except an entomologist. The descriptive work of the older entomologists was crude and primitive, it is true, but they did the best they could at that time, and the only wonder is that they did so well; and though there was less hunting for obscure punctures and hair-splitting differences, their work will line up, so to speak, with that done today; but to graft the one onto the other is at times almost like attempting to weld platinum onto cast iron. Some of the older work must of necessity give way to that of a more concise character; but we are in danger of forgetting that all of this is preliminary to the main object, that of enabling us to go on in getting a better and broader knowledge of animal-life and the inter-relationships existing between the different subdivisions that we arbitrarily erect. Nomenclature is a means and not an end. How often does the systematic entomologist for a moment consider whether or not the description of a new species from a single individual, not always too perfect at that, which differs but slightly from some other species of precisely similar habits, will enable his fellow worker in the applied science, or in morphological investigations, to solve some obscure problem of insect attack or diffusion! Does he ever stop to think that a valid species is a veritable guide-post to prevent the investigator from losing his way, while a synonym is a rock in his pathway, that at best only obstructs his progress?

Synonyms are not so bad if, after they have died and are buried, they would only stay dead and out of the way; but such is not the case; on the contrary, they are liable to be suddenly resuscitated and again torment the morphologist. Names that have been in use for a half or three-fourths of a century, and are current the world over, are suddenly displaced by one that has never come into common use, is even less applicable to the insect, and for no other reason than that someone a few years earlier described a form thought to be the same. *Mytilaspis pomorum* is a good illustration, as it has lately been displaced by *Lepidosaphes ulmi* Linn., when, as a matter of fact, Linnæus seems to have never described the

species, never figured it and, strictly speaking, never named it, as he only named Reaumur's figures of a Coccid on elm. Surely, such work as this does not advance the science of entomology, and one can hardly believe that the ashes of Linnæus are additionally honored by this revolution in nomenclature. The generic name was applied to the species by Shimer many years ago, but nobody else has used it until lately. But this is not the worst case by any means. In 1824 Thomas Say published a good description of *Smerinthus geminatus*, accompanied by a most beautiful and accurate illustration of the moth, drawn by Mrs. Say. In breeding a number of these moths, there sometimes appears an occasional individual with a single ocellus, and there is every gradation between this and the typical form. It so happened that Drury, in 1773, described this form as *jamaicensis*, with the statement that it came from Jamaica. Now, it has never since been found in Jamaica—it is only an extreme variation, and as stated by Dr. Smith, though this name has priority, it is not only a misnomer, but is inexpressive and absolutely misleading. The description does not describe the species at all, yet because of priority of publication, Say's name has recently been reduced to a synonym, after having been in use for over 75 years and filling all the requirements of a name. But let us imagine a parallel case. A naturalist, from Mars, for instance, lands on earth and begins to describe species beginning with man. He happens to alight in Patagonia and forthwith describes one of the most degraded forms of the human race. Another investigator, a few years after, happens to alight in the north temperate zone, and describes, we will say, the Anglo-Saxon. Now, following this same law of priority, and with no less regard for the truth that science is supposed to portray, the Patagonian must forever be the type of the human species, while the Anglo-Saxon must content himself with being a bleached-out synonym. This is a good illustration of what I have in mind when I say that some men are getting in the way of others. Again, we have been lately surprised to see the name of the codling moth *Carpocapsa pomonella*, a name by which it has been known so long that there is no difficulty

in making any entomologist in any country understand to what species you refer in applying that name to it, suddenly transformed to *Cydia pomonella*. But, before entomologists have had time to get their labels changed to conform to the new regulation, there comes a bulletin from the Department of Agriculture, with the old name reinstated, with an explanation that it is the proper one to apply to this insect. These two publications emanating from institutions almost within a stone's throw of each other, within the space of a few months, the one contradicting the other, offer a good illustration of my bridge building. Probably every fact that was available for the use of one writer was equally available to the other, and there was absolutely no excuse for this double change in the nomenclature of this, one of the most common and important species with which the economic entomologist has to deal. Of course no wrong was intended by anyone, but is it any wonder that the mass of people get disgusted with these things and young students discouraged? If this keeps up, notices of changes in nomenclature will have to be sent out by wire or 'phone; the usual method of publishing these is certainly too slow. Of course there will be the danger of head-on collisions, between priorities while in transit, and two may reach an entomologist at the same time and leave the poor recipient utterly befogged as to which to follow. I have noticed that, even now, when entomologists greet each other, instead of the genial hello, which I have heard ring out so full and jolly, for so many years, there is an air of abstraction; a seriousness as of long and careful meditation, as they meet and ask each other which nomenclature they intend to follow, that of Smith or that of Dyar? The fact is, modern entomological nomenclature has become more literary than scientific, but if it could only be placed where it properly belongs and kept there until the really scientific results could be separated from the enveloping obscurity, it would be a decided advantage. The trouble at present is not that all systematic entomologists are failing to do good substantial work, because this is not true, but the difficulty lies in what seems to have come to be an unwritten law, that we must accept and immediately adopt, the latest

revision, regardless of its merits or whether or not it is as good, better or worse than the one we are already following. It is doubtful if names that have been in general use for 20 years or over, and still continue to enable us by their use to indicate clearly and explicitly certain insects, ought to be changed, so long as this condition obtains and science is not injuriously affected thereby. We cannot, for illustration, have two species of the same name in the same genus, neither can we have two genera of the same name, but it seems to me that common sense ought to figure in science as well as in other things, and as between two names the one retained that will best fulfill its mission. In fact, after all has been said, our troubles are largely of our own making and due to our own stupidity. We cling tenaciously to our laws of priority, and yet accept, instantly, the statement of anyone who chooses to revise a genus, group or family. Can there be two courses of action more diametrically opposite to each other? The trouble is not that there is too much activity, but in over-publication, based on under-investigation, and the premature acceptance of results so obtained. You may call it a case of chronic entomological indigestion, if you please, and any sort of indigestion makes cranky men. No one wishes to banish the systematists, or curtail their labors, but there are many of us who want to see the results tried, or at least tested, before being compelled to accept them. We want the acceptance to be based on actual merit and not on the fact that they are the freshest from the printer. The economic entomologist and the morphologist are fully justified in refusing to accept, at once, changes in nomenclature that are not based on actual rearings, except in cases where the change is so plainly demanded as to leave no reasonable doubt of its validity. If there was more conservatism in the acceptance of changes in nomenclature, there would be less hasty work done and less premature statements published. As it is, an instructor in entomology may take his class to the woods in the forenoon and show his pupils a species, which he calls by name, and inform them that he will expect them to render an account of their observations, giving the name thereof in class the following morning; but,

when morning comes and he receives his mail, he is astounded to learn that he has just time to revise his nomenclature, and is obliged to inform his pupils that what was one species yesterday is another to-day, and escape explanations the best he can. He may finish his lecture for the next day very late at night and find that he must revise it before going to his class in the morning. In fact, if this thing keeps on and he is a very deliberate speaker, and the name of the species a very long one, he may be caught in the midst of it, in mid-air so to speak, in order to meet the very latest literary revision in a most unnatural nomenclature.

With the morphologist, genera and species imply relationships, to him of the greatest importance, but if these are to be continually shifted about, retired and again regenerated to suit the mind of the individual systematists, how is he to make any progress in his investigations? Again, if the worker in applied entomology, or the morphologist, puts forth a new fact, it is accepted on probation and must wait until it has been further tested before final acceptance, while the opinion of the systematist jumps at once into rank as an authority. Why so much precipitation in the one case and not in the other? Why precipitation at all? The lexicographer will admit new words only after they have been shown to be necessary, in order to express certain thoughts or ideas, or to indicate certain objects. Why not apply this plan to innovations in entomological nomenclature? In other words, apply the same rules in regard to discoveries in nomenclature that we do to similar discoveries in other lines of research; adopt after proof of correctness and not before.

Old laws and regulations have inevitably to be amended or modified, in order to meet changed conditions and requirements, and it is one of the most infallible indications of human progress in jurisprudence when those upon whom the duty devolves, rule more and more within the spirit and less and less in accordance with the mere letter of the law. No law of priority can be framed to meet every possible exegesis that will arise, but it would certainly seem that the laws of priority in entomology might be advantageously modified, and then

broadly applied, in a manner to remove at least some of the present unsatisfactory features. At present there is altogether too much in systematic work left to the opinion of the individual, a condition that has never proven for the best in any of the affairs of human life. An individual may be sincerity and honesty itself, yet be in the wrong, and with far more frequency than would a comparatively small body, with a wider range of experience and opinions.

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### An Early Collector in California.

BY FORDYCE GRINNELL, Palo Alto, Cal.

Pierre Joseph Michel Lorquin was born in Valenciennes, Northern France, about the year 1800. He entered the University of Douay, graduating with honors, when he entered a notary's office as first clerk and rose steadily until he obtained papers which entitled him to practice his profession. In 1840 he removed to Paris where he was referee in the High Tribunal: this was a high office at that time, and the occupant was of considerable importance. In 1848 the Revolution broke out and Lorquin applied for a position in Algiers: he obtained this and took up his residence at that place; this was his first most important voyage, and here he collected a great amount of valuable and interesting lepidopterological material.

Hearing of the discovery of gold in California in 1850, he relinquished his position and set out for the new El Dorado; but gold was not first in his mind, it was the thought of the virgin field he would be the first to explore scientifically, and the number of new things he would be sure to get. He arrived in 1850 and started for the mines in Tuolumne County, probably no doubt to practice his profession as a lawyer, as there was plenty for lawyers to do in those days of '49. Here he began his collections. He sent for his family, and they arriving in 1852, he set out for a tour of the northern part of California; from Sacramento he went to Downieville, Plumas County, Eldorado County, Stockton and Carson City, Nevada. His excursions were continued in the South where he visited Los Angeles and San Diego. At the latter place he obtained

*Lycæna regia* or *sonorensis*. On account of his son's health, he returned to San Francisco. The next year, 1854, he started on another excursion northward and visited Monte Cristo in Sierra County, Yuba River, Amador County, Calaveras County, Mariposa County, south to Fresno County, and north to Marin County and Sonoma County till 1856. In the latter year, he started out for Manilla, Philippine Islands, but came back again in 1861, when he remained one year. In 1862, he left for Cochin China and visited the following places in turn, always collecting Lepidoptera:—Hong Kong, China, several islands of the Philippine group, Celebes, Aru Islands, Ceram, Amboyna, Ternate, Gilolo and Java. In the latter place he had an attack of fever which compelled him to remain in a hospital for some time. When he recovered, he returned in 1870 to Paris. He travelled a little in Southern France and Spain collecting butterflies and moths. He had prepared to return to the Philippines again but died only a few days before he was to start in 1877.

Mr. Lorquin was a medium sized man, and had a very strong constitution which enabled him to travel everywhere in search of specimens, always on foot. He was a great pedestrian, being able to walk long distances without being fatigued. In his travels in the East Indies, he lived with the natives by whom he was much helped in his travels and collecting.

Mr. Lorquin is an important character in California Entomology, as almost all the Lepidoptera described from the Pacific Coast by Boisduval were collected by this man. Dr. Boisduval was Lorquin's family physician.

In 1852, Dr. Herman Behr and Mr. Lorquin met in San Francisco and from that time were close friends. Dr. Boisduval always sent a specimen of each species when he described it back to Lorquin and these co-types were turned over to Dr. Behr and are now preserved in the museum of the California Academy of Sciences. Lorquin also collected other insects, especially beetles, and one, a cerambycid, is called *Calloides lorquinii*.

Mr. Lorquin never learned English well enough to converse very intelligently in it; just before he set out for the Philippines he told Dr. Behr that it was a shame that he was just on the point of learning English and now he had to drop the project.

Pierre Joseph Michel Lorquin holds a unique position in California Entomology as the discoverer of so many of our species, and will always be thought of in connection with that noted group of California students of the Lepidoptera—Behr, Behrens, Stretch, Henry Edwards and Rivers.

I am indebted to Mr. E. F. Lorquin of San Francisco for these particulars in regard to his father's life.

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### Some Notes Chiefly on the Scarcity of Michigan Rhopalocera in 1903.

BY W. W. NEWCOMB, M.D.

Considering the editorial in the last October NEWS, and my own experience during the collecting season of 1903, I have expected to find some interesting comments in the entomological journals on the scarcity of butterflies and other insects. Up to the present time (April, 1904) little has appeared, but I am informed that the unusual weather conditions of 1903 have not been confined to this region alone. Undoubtedly also the preceding wet cold summer (1902) affected the butterflies last season.

The essential weather features in 1903 were as follows: spring began early with unusual warmth, and both March and April were advanced for the season. Almost a summer temperature (70°) occurred on March 18th. Towards the middle of May it was abnormally hot and dry, but at the end of that month it became very wet. June and July for the most part were wet and cold, and cut down the number of days when outdoor observations could be made. August and September were more nearly normal for those months, except that they were too cold.

The scarcity of Rhopalocera was not alone in numbers, but also in varieties. On July 6th twenty-three species were seen, the greatest number on any one day throughout the season. On the other hand, I have walked miles to bring home hardly a half dozen desirable specimens and to see not twice as many kinds. In fact, one could consider himself lucky if he saw seventeen or eighteen varieties in one day.

Such species as *D. plexippus*, *A. bellona*, *P. tharos*, *G. inter-*



*rogationis*, *G. comma*, *G. progne*, *V. antiopa*, *P. atalanta*, *P. huntera*, *L. archippus*, *N. canthus*, *N. eurytris*, *S. alope*, *C. thoe*, *L. pseudargiolus*, *L. comyntas*, *P. rapæ* and *C. philodice*, were, perhaps, little, if any, affected. On the contrary many others certainly were. In the beginning of its appearance at the end of June, *A. cybele*, while not rare, was considerably less abundant; a few specimens were seen up to as late as September 6th. *A. aphrodite* was decidedly scarcer, while not one specimen was seen of *A. myrina*, a species ordinarily appearing in moderate numbers. A few examples of *P. cardui*, which is not common, were found, and two or three specimens of *L. ursula*, also uncommon here, were reported. *T. edwardsii*, *T. calanus*, *T. titus* and *C. hypophleas* were scarce in comparison with other years. The *Papilios*: *polyxenes*, *troilus*, *turnus* and *creosphontes* were also in fewer numbers. The larvæ of the last named species were fairly common on prickly ash in September and October, but were not so abundant as in some years. The Hesperidæ especially were scarce, and whereas in other seasons many appeared, few were to be seen of such common kinds as *P. cernes*, *P. peckius*, *P. hobomok*, etc., and even the numbers of the little *A. numitor* were somewhat restricted. The only members of this family at all common were some of the *Nisoniades* early in the season—*E. pylades* and *E. tityrus*. None of the rarities here, *A. idalia*, *M. harrisii*, *P. nycteis*, *G. j-album*, *V. milberti* or *P. philenor*, appeared at all. The observations made above are for Detroit. In Oakland County, 25 or 30 miles northwest of Detroit, two or three specimens each of *A. myrina* and *P. nycteis* were reported. *L. ursula* is also more common there, and I saw six—four in July and two on September 14th.

If, however, the usual numbers failed to appear there was some compensation in finding five species whose presence was previously unknown to me, although I have been more or less familiar with the butterflies in this vicinity for fifteen years. The first surprise was on May 12th, when three specimens of *Thecla irus* var. *arsace* were taken. They were flying at the edge of an oak woods bordering a road and alighted on some low vegetation where they were easily caught. A return to the

same spot three and again nine days later failed to show any others, except possibly one uncaught suspect. On July 3rd, a male of *Pamphila dion* was taken, and on the 6th two others, a male and a female. These large handsome *Pamphilas* were found adjacent to a marsh. On July 12th, at Clarkston (Oakland County), I found one somewhat worn *Eudamus bathyllus*, the third addition to the list. The form invariably found at Detroit has been *pylades*. On July 13th, also at Clarkston, I saw fluttering above some grass and clover a small yellow butterfly which I supposed was a dwarfed *C. philodice* until it was caught. It proved to be *Terias lisa*. On September 1st, a second specimen was taken in Detroit, and on September 21st, a third one at Clarkston. Two others were also taken in Detroit, but not by myself. The fifth addition was *Junonia cœnia*, which personally I have never been fortunate enough to observe here. One was reported to me as caught on August 10th, others were seen about the same day and still another was observed on October 4th, but, although I searched diligently for them in August, I could discover none.

Of further interest was the discovery of a locality where, in a favorable summer, *Melitea phæton* promises to be abundant. Heretofore, I have seen only three specimens which were taken in separate years. This season I caught nine and saw several others. I would mention also finding one larva of *P. ajax*, the first one known to me to be taken here. Pawpaw is found in small patches in only a few localities near Detroit, but, nevertheless I usually see a limited number of *ajax* butterflies every summer; this year about ten. When in Ann Arbor a few years ago, the month of May usually showed a few of the butterflies. Doubtless this region (Detroit, Ann Arbor) is close to the northern range of *ajax*, probably only because the pawpaw does not extend farther northward.

It must not be presumed that I consider the cold, wet weather as accounting for the finding of the additional species. Rather it is due to seeking new localities and to more frequent and persistent hunting when there seemed to be little to reward one's efforts, perhaps one advantage of an unfavorable season. It seems strange, however, that the presence of *T. lisa* should not have been brought to my notice before, but I have specimens of *C. philodice*, for which as far as size is concerned could easily be mistaken for it. Again, it is interesting that the only *J. cœnia* caught was by a beginner. Doubtless another summer will show still other species not previously observed, and I am looking for additions, especially among the Hesperidæ and the *Theclas* and possibly some southern strays.

## Micro-Lepidoptera—Suggestions.

BY W. D. KEARFOTT.

(Continued from p. 169, Vol. xv, No. 5.)

### *Part III.—Breeding (continued).*

Common jelly-glasses, with tight tin covers, make very good breeding-jars for the house. I also use several sizes of screw-

top jars of the style as shown by Fig. 18. They are made in a number of sizes ranging from small ones of an ounce capacity up to large ones about six inches tall by three inches in diameter. The particular advantage of both the common jelly-glasses and the screw-top jars is that they have no inside ribs or ledges to gather dirt or for the larvæ to spin their food-plant to and prevent its easy removal for cleaning, etc.

For convenience of handling, a few shallow trays should be made, just wide enough to hold a glass or jar, and about twelve or fifteen inches long. For the longer vials (Fig. 17), racks such as are used for holding rows of test-tubes are

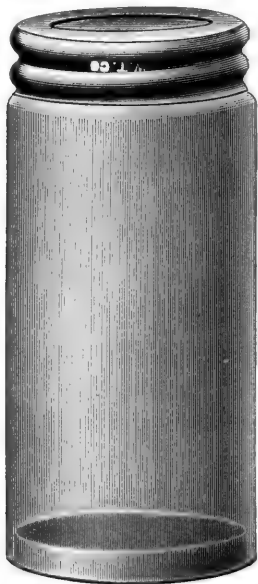


Fig. 18.

very convenient.

It is well to go over the material collected as soon as possible after returning from a trip, taking one vial or box at a time and carefully drawing out with forceps the small clusters of leaves that may have been packed in too tightly for comfort, and placing them in a jar of suitable size, so that the contents will not more than half fill it. Then write on a slip of paper date, place and food-plant; use pencil always, the dampness will make an undecipherable blot of ink. Leaves of firm texture, such as those of the hardwood trees, can be closed up tight without danger of sweating or mold, but some of the

softer leaves, especially of succulent annual weeds, are apt to get too wet; and if drops of water are observed on the inside of the glass, remove the tin cover and close the top with a piece of cheese-cloth held on by a rubber band. A day or two of drying out is sufficient-

Each jar should be examined every day, both for the purpose of seeing if any moths have emerged and to see that the condition of the larvæ is healthy,—in other words clean. After a very little experience, it will be easy to observe when the food is becoming stale or soggy or that too much dampness is accumulating on the leaves or bottom of jar, all of which will lead to mold and sickness. Then the larvæ must be changed to entirely fresh food and a clean jar. Select a duplicate of the one they were in and place in it a moderate quantity of the food-plant; then dump out the contents of the old jar on a large sheet of clean paper, and with fine forceps carefully examine every fragment, picking up each larva delicately with the forceps,—which will not hurt him if not squeezed too tightly,—and drop him on the leaves in the fresh jar. Should any pupæ be found, it will be better to place them in a separate jar or vial, where they need not be disturbed again; but be sure and write a duplicate label, so that the identity will not be lost.

The great majority of the larvæ taken in the early part of the summer, up to the middle of July, will emerge as moths within one to three weeks after transforming to pupæ. Some of those taken later than this will live as larvæ or pupæ all winter; and species hibernating in this state must be kept out-of-doors under as nearly natural conditions as possible.

I have left to the end the subject of making notes and recording observations of all larvæ that are bred, as it is really the most useful and important part of the whole work. The life-histories and habits of our North American species of Micro-Lepidoptera are so little known that up to this time less than twenty per cent. have been described. So this field is one of the easiest in nature in which a collector just starting can find lots of room for original work.

My method is as follows:—On the slip of paper in each jar I write a number, and in a note-book (card index cards are bet-

ter) record the same number at the top of the page or card, with date and place and name or description of food-plant ; if the latter is unknown, press a piece and send to your nearest botanical friend for determination ; with your breeding number on the label.

Then on the card make a description as full as possible of the larva, noting shape, color, stripes and spots on the body, color and spots (if any) on head, thoracic shield and legs. State its habits, whether it crumples, folds or curls leaf, or lives in stems or fruit, and anything that seems interesting about it.

If you can observe date of pupation, make record of it and, of course, when moth emerges do the same.

Put this same number on everything that issues from this particular jar. There will be Dipterous and Hymenopterous parasites ; it is just as likely that they are unknown, or at least have never been bred, so your record of their " hosts " will be of value. The pupa and cocoon should also be preserved, and if a sample of the twisted leaf, etc., can be saved, both should bear the same breeding number. It is well to put the initial of your name in front of this series of numbers, as K. 427, to distinguish your bred material from other specimens in your collection that may happen to have miscellaneous numbers on them.

It may not be well to undertake too much at once ; but after

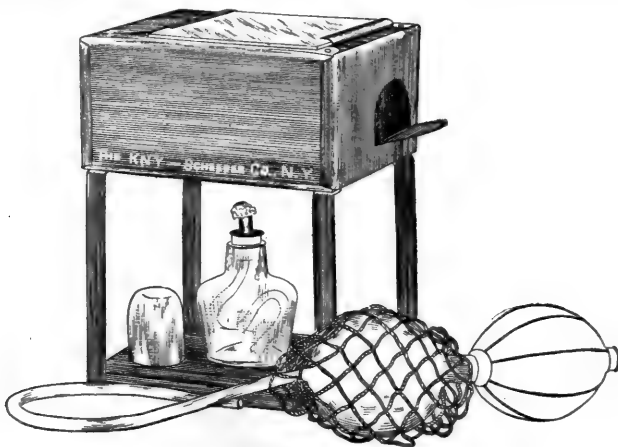


Fig. 19.

this work is well started, you will want to preserve a specimen of each different kind of larva. Any method of preserving in liquids is objectionable, owing to difficulty of taking care of numberless bottles and the great trouble of studying the specimen so enclosed. I use an ordinary larva-inflating oven and apparatus, the same as is used for large caterpillars, and as shown by Fig. 19. The only difference in blowing large or small ones is that, for the little ones, the glass tubes must be pulled out to a very fine point. When ready to inflate, I take the alcohol lamp from under the oven and place it before me on the desk and, holding a glass tube by both ends, heat the middle of it in the lamp-flame; when, and not until, it is a dull red, I give both ends a quick pull, which leaves two very fine hair-like points; repeat this until you have enough. Place the lamp back under the oven, so that it will be warmed up for the next operation.

Then pick up a larva and drop him for a moment in a tiny glass of alcohol, and as soon as he is motionless, lift him up and lay on end of forefinger of left hand, with anal end up; then very gently, with thumb or pencil, squeeze the contents through the anal opening; a sharp knife to scrape this away as fast as it appears will prevent discoloring the skin.

Still holding the deflated skin between thumb and forefinger of left hand, pick up a glass tube, wet the point to prevent sticking, and carefully insert in anal opening. Then for a second or two hold in the oven, which will cause the skin to stick fast to the tube. Then stick the big end of the glass tube in the rubber tube connecting to the double bulb, and give the latter the least bit of a squeeze, and if everything has been properly done, the skin of the larva will spring out rounded and full size. Then, still keeping up light pressure on bulb, place in oven for a minute or two, until the skin is hard.

With a pair of sharp scissors, snip off the glass tube about a sixteenth to an eighth of an inch behind the larva.

To mount, draw a number six pin through a small block of cork about a quarter of an inch square, then at right angles to the big pin stick a Minutien-Nadln through until the point comes out the other side a quarter of an inch or more. Touch the point of the Minutien-Nadln with thin shellac and care-

fully raise the larva and stick the point in broken-off' end of glass tube. Label with usual locality label and breeding number. Of course, the same tube can be used many times, by holding the broken tips of two over the flame together, which will fuse them; let them cool a moment, and then heat a little back from the junction and draw out a new point.

As soon as the name of the bred specimen can be obtained, it should be written on the card, containing its life-history, and from time to time the facts should be published. The Editor of the NEWS is hungry for just such original notes. My services are freely offered here as elsewhere, and if any collectors care to send me, in the fall after the breeding season is over, their notes and specimens, it will be a pleasure to identify the latter and put the former into shape for the printer, of course, giving full credit to the collector.

The space limitations prohibit a very elaborate explanation of every detail of the work which has been outlined in a general way in this series of articles, and naturally some essential points have been overlooked; for instance, the proper height at which the insects should be placed on the pins, which, in the case of Kirby No. 1 pins, should be at such a height that three-quarters to seven-eighths of an inch of the pin is below the thorax. This will make the plane or flat surfaces of the wings, when spread, about one inch above the point of the pin. Minutien-Nadln should be stuck clear through the thorax, leaving only about an eighth of an inch of the head or blunt end above it,—just enough to grasp with the forceps; this will leave the greater part below the insect, where all the length possible is required for pinning on setting-boards and through the double mount. Mr. Merrick calls my attention to this omission, and also adds that the tin portable moth trays, made from his plans, should be rivetted together and not soldered. Experience with solder on several occasions was disastrous.

As the majority of the readers of this are well aware, Mr. Merrick has a large heart and kindly disposition; hence, anyone wanting to know more about the traps of his invention will receive full advice and direction by addressing him.

My collection of all of the families of Micro-Lepidoptera is

very complete and well worked up ; in fact, some groups contain a larger proportion of named species than any other collection in North America ; hence I am always willing and glad to name small or large lots of specimens for new or old correspondents, and invite correspondence from any and every one who may be or who may become interested in this very fascinating study, and advice or assistance can always be had for the asking, both in regard to the collecting and rearing, as briefly discussed in these papers, and as well the identifying of specimens.

The electrotypes of Figs. 17 and 18 were loaned by Messrs. Whitall, Tatum & Co., and of Fig. 19 by the Kny-Scheerer Co. All of the special apparatus referred to in these Suggestions can be purchased at reasonable prices from the dealers who advertise in the NEWS.

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### On *Ropronia garmani* Ashm.

BY J. CHESTER BRADLEY, Ithaca, N. Y.

(With Plate XIV.)

As no species of this anomalous and highly interesting genus has been figured, I thought that a figure of the undescribed female of *R. garmani* might prove of considerable interest to those who have not been fortunate enough to see actual specimens. The genus was originally described by Provancher from *R. pediculata*, ♀. It has been variously placed in the Evaniidæ, Braconidæ, etc., and now Dr. Ashmead places it in the subfamily Monomachinæ of the family Heloridae, thus allying it with the equally anomalous European genus *Monomachus*. This is probably the nearly correct position, although the ovipositor in my specimen does not seem at all that of a Proctotrypoid insect. Provancher originally placed the genus among the Braconidæ, but later transferred it to the Helorinæ. The general appearance is like that of an *Evania*, for which a person could readily mistake it, as I did, in the field. The insertion of the abdomen between and slightly above the coxæ quickly undeceives one, however. As the female is undescribed, I append a description in full. There are three species which have been treated in a paper on the genus in the Proc. Entom. Soc. of Washington, iv, p. 132. Dr. Ashmead, in his "Clas-



sification of the Proctotrypoidea," Journ. N. Y. Ent. Soc., x, p. 243, Dec. 1902, states that the claws of *Monomachinæ* are simple, using this character with others to separate them from the *Helorinæ*. My specimen, however, has the claws pectinate. Dr. Ashmead, at my request, kindly re-examined his specimen and found that the posterior claws had two small teeth beneath, the others being apparently simple. As the claws are very small and the teeth quite difficult to detect, it is probable, however, that they are all really pectinate, as in my specimen. Dr. Ashmead also informs me that the spelling *Roptronia* used in his paper is an error.

The photograph of the insect was very kindly made for me by Prof. M. V. Slingerland.

**Ropronia garmani** Ashmead.

♀.—Entirely black except front and middle tibiæ and tarsi. Head, seen from above, transversely quadrate; cheeks broad; mandibles bidentate, the inner lobe much the longer; clypeus broadly transverse, the anterior margin rounded, slightly and very broadly marginate; antennæ inserted in the centre of the frons, in a depression between the prominent eyes, the distance between the bases of the antennæ approximately equal to the distance between the base of each antennæ and its corresponding eye; thirteen joints are present in the specimen, but the apical one or two are broken off, so that there should be fourteen or fifteen, the scape is considerably shorter than the third joint; the antennæ are thickened toward the apex of the third joint and taper to their apex; the three ocelli are placed close together in the centre of the vertex, two on a line and the third in the centre and front; head entirely covered with a griseous pubescence, longer on the cheeks and front, close-cropped and scarcely noticeable on the vertex; antennæ clothed rather thickly with brown hairs; mandibles clothed with white hairs, punctate; clypeus and frons coarsely punctate; vertex evenly and finely punctate in front, transversely wrinkled behind the ocelli. Neck short, so that head is borne in juxtaposition to the thorax. Thorax narrower than the head; pronotum restricted to a narrow bar in front and extending laterally to the tegulæ, a prominent ridge separating it in front from the pleura which extend around and meet each other in front of and at right angles with the pronotum; mesonotum well developed, the parapsidal grooves deeply impressed; scutellum and post-scutellum well developed, the latter but slightly shorter than the former; each axilla produced into a lateral projecting tooth, prominent as seen from in front; propodium tapering convexly to the insertion of the petiole; sides of thorax irregularly subreticulated with a smooth patch on the mesopleura; pro- and meso-notum evenly punctured, posterior dorsal sclerites more roughly

reticulated ; entire thorax more or less sparingly griseo-pubescent. Wings hyaline, nervures brown ; arrangement of nerves as shown in the figure in fore wing ; the hind wing acute at apex and without a separate anal lobe, anal furrow well marked ; costal and subcostal nervures distinct but closely parallel, forming, especially toward the point where they finally coalesce, just before the hooks of the wing, a distinct though very narrow costal cell, which may be turned over so as to be indistinguishable from a side view ; the only other nervure, arising beyond the base of the subcosta, bifurcating shortly beyond its origin and extending each fork to the margin, is shown in the figure. The tarsi and more or less of the tibiæ of the front and middle legs are yellow, the rest black ; posterior and middle tibiæ with two apical spurs ; tarsi five-jointed ; claws with three distinct pectinations beneath. Petiole two-thirds the length of the thorax ; abdomen highly compressed laterally ; the second joint very large, longer than the petiole, remaining joints short, all of them together less than the second joint ; abdomen smooth and highly polished, the apical margin of each joint finely punctured ; ovipositor short, straight, or curved slightly dorsad, and exerted from a distinctly ventral position, pointing dorsad. The ventral and dorsal segments of the abdomen appear of approximately equal size from a lateral view. Length 9 mm.

The writer took one female, July 1, 1903, at Cobb's Creek, Delaware Co., Pa. It is now in his own collection.

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### New Forms of Exotic Papilionidæ.

BY GEORGE A. EHRMAN, Pittsburg, Pa.

While rearranging my collection of Papilionidæ, which consists of nearly three thousand specimens from all parts of the world, I find a few representatives that are new to science, and which will be, I am glad to say, of much interest to the student who finds as much beauty in the exotics as some of our entomologists do in our native species.

#### *Ornithoptera ritsemæ* Snell., n. var. *tantalus*.

*Male*.—An extreme form of *O. ritsemæ* ; the upper side of the apical parts of the forewings is much more suffused with yellowish rays than is found in the typical form of this sex of this species. The hind wings have in the submedian space in each cell (the cell between the costal and subcostal nervures being excepted) a large, elongated, black-suffused spot, and the crimson collar is absent ; these three points of difference make this form very conspicuous.

This interesting form was collected by Herr John Waterstadt in the German possessions of North Borneo, and through whose

untiring energy the writer is indebted for much material from that part of the world.

Habitat, Kala Bula Hills, N. Borneo. Type, Ehrmann Coll.

**Ornithoptera cambyses** n. sp.

*Male*.—Allied to *O. davius* Gray; but the forewings are more falcate at the apex than in that species, and the hindwings have a more delicate yellow color (similar to *O. andromache* Staud.), and in each cell there is a small, black, oval spot 4 mm. in diameter; this row of spots is on the submarginal inner space, and gives to this species a very odd appearance.

I received this species some time ago from a Mr. Knechtel, who had received it in a small sending from a friend who resided at Columbo, Ceylon.

Habitat, Columbo, Ceylon. Type, Ehrmann Collection.

**Papilio klagesi** n. sp.

*Female*.—Upper side of head, thorax, body and antennæ are smoky black. Forewings, the outer half is semi-transparent, becoming more opaque toward the outer margin; the inner or basal half is deep velvety black; on the fascia between veins one and three is a white quadrate-shaped spot, one-eighth inch wide and three-sixteenths of an inch long. Hind wings are of a uniform deep velvety black; there is a row of five bright pinkish spots in the middle area extending from the abdominal margin to the apex, the first beginning at the abdominal margin is triangulate, the second and third are oblong, the second being the longest, one-eighth by one-sixteenth of an inch in size. Spots four and five are almost round, spot four is one-sixteenth of an inch in diameter, while number five is but one-thirty-second of an inch in diameter, dentations obscure.

Underside—There is a small red spot on the prothorax and three very faint spots of the same color near the base of the wings, the two segments nearest the thorax have also slight indications of a red spot on each side of them; the legs are black, all wings the same as above but of a lighter shade. Expansion, one and four-fifths inches.

This very interesting species of *Papilio* I consider of great importance, as it shows a transition between the *echelus* Hubn. and *chabrias* Hew. groups, and up to the present time it is the smallest species known. This little creature was discovered by Mr. Edw. A. Klages at Suapure, Venezuela, South America, and seemed of the greatest rarity, as the writer has been informed by that gentleman that he saw but two examples during his whole sojourn in the tropics. Type in Ehrmann Coll.

## Thaumatoneura Again (Odonata).

By PHILIP P. CALVERT.

Mr. F. D. Godman has recently acquired for the *Biologia Centrali-Americana* six males of this genus, taken at Carrillo, Costa Rica, by Mr. C. F. Underwood. Four are *T. inopinata* McLachlan, two are new as follows :

- Wings with a black or dark brown band for their entire width, from the nodus or (even a little proximal thereto) to more than half-way to the pterostigma; no transverse pale citron band on frons or nasus . . . . . *inopinata*.  
 Wings uncolored; a transverse pale citron band on nasus and on frons connecting the yellow genal spots . . . . . ***pellucida*** n. sp.

*Pellucida* does not differ in the appendages, nor do the uncolored wings indicate a mere age-difference, for not only is no trace of a dark band visible, but both individuals are pruinose on head, thorax, base and apex of abdomen. Mid-dorsal thoracic carina yellow, abdominal segments 3-5 largely brown. Abdomen 56.5-58, has wing 47 mm.

*Inopinata* also has the mid-dorsal thoracic carina yellow (this part of the thorax was damaged in the type). Three males, with pruinose on pectus and apex of abdomen, have 3-5 brown in basal four-fifths, black in apical fifth and narrowly at base; remaining male with 3-5 all black. Width and contours of black bands on wings variable. Abdomen 58-59, hind wing 47-49 mm.

In all six males.—Antenodals on front wings 3, except 4 on left side of one *pellucida*; on hind wings 3, except 2 on right side of one *inopinata*, 4 on left side of one *inopinata* and on right side of one *pellucida*. Quadrilateral free, except for a single cross-vein on right hind wing of one *inopinata*. Two submedian cross-veins, except 3 (2 of them under quadrilateral) on right hind wing of one *inopinata*. Subnodal sector begins (a) proximal to nodus on left hind wing of one *inopinata* and left front wing of one *pellucida*; (b) at nodus in four hind wings (two asymmetrical) of *inopinata*, and right front and right hind wings of one *pellucida*; (c) distal to nodus on all front wings (eight) and three hind wings (asymmetrical) of *inopinata*, on all four wings of one *pellucida* and on left hind wing of the other *pellucida*.

*Bibliography*.—McLachlan, Ent. Mo. Mag. (2) viii, pp. 130-131, 1897. Calvert, *l. c.*, xiii, pp. 29-32, 1902; Biol. Cent. Am. Neur., p. 58, pl. iii, figs. 16, 21, 27, 1901.

## New Meloïdæ from Arizona.

BY HENRY SKINNER.

**Calospasta wenzeli** n. sp.—Head red, oval, smooth, median line feebly impressed, antennæ black; thorax longer than wide, narrowed anteriorly; elytra rich metallic shining blue or green, as individuals differ in color, clothed with rather long white hairs; legs red; abdomen red, with ventral surface green or blue. Length 7-10 mm.

This handsome species is very different from any of the known forms and is the only species having the head and thorax concolorous, except *mirabilis* Horn. It is named after that unsurpassed collector and master of technic, Mr. H. W. Wenzel. Numerous specimens were taken at Florence, Ariz., August 10, 1903, by C. R. Biederman.

Type in collection Acad. Nat. Sci. Phila.

**Epicauta abadoni** n. sp.—Head immaculate, ferruginous; abdomen, legs and elytra rufo-testaceous; thorax with an olive green spot, rather obscure, and two parallel lines which are produced by the absence of pubescence; three narrow, dark brown vittæ, the one nearest the margin almost obsolete. Length 11-15 mm.

This species comes nearest to *lemniscata* Fabr., but differs from it in color, the narrower vittæ with one nearly obsolete and the immaculate shining reddish head.

Phoenix and Tucson, Arizona.

Type in collection Am. Ent. Soc.

**Epicauta alastor** n. sp.—Head, thorax, elytra, abdomen, femora and tibiæ mouse-color; antennæ and tarsi reddish brown; there is a very narrow dove-colored line running the length of the elytra midway between the suture and the margin; the margin and suture are narrowly edged by the same color. Length 12-16 mm.

This species also resembles *lemniscata* and *vittata*. Numerous specimens were received from C. R. Biederman, taken at Florence, Arizona, August 10, 1903.

We also have specimens from Yuma and Phoenix.

Type in collection Acad. Nat. Sci. Phila.

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DR. HENRY SKINNER.—If I may be granted preemption in the Parnidæ, and you will so signify under "Notes and News," I shall be grateful. Material from the southern and western sections of the U. S. is especially desired.—WM. D. RICHARDSON, P. O. Box 185, Fredericksburg, Va.

# ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

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PHILADELPHIA, PA., JUNE, 1904.

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The following has been received from Mr. Merrick, and the matter is of considerable importance to those active in exchanging. We trust that those interested will promptly reply, so that the result may be published in the NEWS.

"I do not know how my suggestion will be received by the fraternity of bugdom, but as it appears to me to be a matter of some importance, will risk a statement of it, in hopes it may result in some good to all of us. In view of the fact that we have two new check-lists, differing very materially and published almost simultaneously, and also the fact that some have arranged their collection in accord with one, and some with the other, and further in view of the fact that 'exchanges' are almost exclusively made by the use of check-list numbers, can not some plan be devised by which we can all use the same list for our exchange numbers?

"I have been the recipient of list-numbers during the past winter as per Smith 1891, Smith 1903, and Dyar 1903. In two of the three cases I found it quite a complicated and tedious matter to translate them into my list of numbers. As each one has preferred to use the numbers he has adopted, and this would accomplish no reform, could we not all agree to adopt the list for exchanging that is now used by the greatest number?

"The collecting season is about to open (let us hope and pray), and next fall, when we are arranging our duplicates, would be an excellent time to make the change to uniformity.

"Let us all vote by postal card as to his or her choice of lists, and the minority change their exchange numbers to accord with the majority. The votes may be sent to our worthy Editor or, if leisure does not serve in his case, the writer\* will gladly receive and tabulate them and publish the result through the NEWS. This does not require any resetting of our collections, which would meet with most decided opposition, but simply uniformity of exchange numbers. Respectfully submitted 'for the good of the order.' What say 'you all?'" Let us have an expression of opinion."—FRANK A. MERRICK.

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\* Please send replies to Mr. F. A. Merrick, 1453 Third Ave., New Brighton, Pa.

## Entomological Literature.

HARRIMAN ALASKA EXPEDITION. Vols viii and ix. Insects, Parts one and two. New York, Doubleday, Page & Company, 1904.

These two sumptuous volumes are parts of a series describing the Harriman Expedition to Alaska. The work is edited by C. Hart Merriam. The insects were collected by Prof. Trevor Kincaid of the University of Washington at Seattle, who was entomologist to the expedition. The material collected was sent to various specialists to be studied and reported on, as follows: Arachnida, Nathan Banks; Myriapoda, O. F. Cook; Apterygota, J. W. Folsom; Orthoptera, A. N. Caudell; Aphididæ, Theo. Pergande; Homoptera, W. H. Ashmead; Heteroptera, O. Heidemann; Odonata, R. P. Currie; Neuropteroid Insects, Nathan Banks; Coleoptera, E. A. Schwarz; Metamorphoses of Alaska Coleoptera, Trevor Kincaid; Lepidoptera, H. G. Dyar; Diptera, D. W. Coquillett; Tentredinoidea, Trevor Kincaid; Sphegoidea, Trevor Kincaid; Formicidæ, Theo. Pergande; Hymenoptera, W. H. Ashmead. These volumes represent a fine piece of bookmaking and a splendid piece of faunal work. They lay the foundation for the future in regard to Alaska insects. One of the first things that attract attention is the phenomenal work done by Prof. Kincaid in a comparatively short time. His studies in the metamorphoses of Coleoptera also makes a most valuable contribution to an important but little investigated subject. Dr. Ashmead's paper on the Hymenoptera is also an important one, two hundred and thirty-seven new species being made known. Sixty-three new species of Diptera were described by Mr. Coquillett. Mr. Harriman has done a noble work for science in fitting out the expedition and making known so much of interest about a comparatively little explored country. This fine work will undoubtedly stimulate a great interest in the entomology of Alaska.—H. S.

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## Notes and News.

### ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

THE NEWS is not published for July or August.

MR. KEARFOTT'S method of using a test-tube for killing Micro-Lepidoptera (described in April News) suggests to me that a description of my poison-tubes may be valuable. I use what is known as a tube-vial, made of clear white glass, with flat bottom, without neck and for a cork stopper. The latter is perfectly tight and handier than a screw-top. A convenient size is 60 mm. in height and 23 mm. in diameter. I also employ a few larger tubes, 75 mm. in height and 25 mm. in diameter, and for the Tineidæ a smaller tube than 23 mm. in diameter can be used. I usually carry eight of these tubes into the field with me, and for convenience in carrying I have made what might be termed a tube-case. I make

this as follows: I take an old handkerchief and cut two strips, in width the length of a tube. Between these strips I sew a thin layer of cotton and then cover each tube with the strips so as to form a cylinder, in and out of which the tube can be easily drawn. I close the bottom of the cylinder by turning in a little of the strips and securing with a few stitches. I sew four (a convenient number) of the cylinders together side by side in a row. I then cover the whole, except the top where the tubes are removed, by a piece of brown denim. The top of the tube-case comes to within about three-eighths of an inch of the tops of the tubes, thus with the addition of the part of the corks above the tubes, there is given ample room to grasp the tubes in removing or replacing the same. The advantages of this arrangement are that four tubes instead of one can be kept in the same side coat or hip pocket as desired; the waste space of a long test-tube is avoided, and any one of the four tubes is at hand when needed. One can have as many tube-cases as he desires and they may be of different sizes for different sized tubes; I use at least three. In Detroit the physicians' supply houses do not keep them, but they can be obtained of Bausch and Lomb for about fifty cents a dozen, depending on the size. These tubes are charged with cyanide, and I have found them very convenient for taking *Lycænidæ*, many of the *Hesperidæ* and *Geometridæ*, *Pyralidæ*, etc. The same principle can be employed with larger tubes for *Lepidoptera* the size of *Colias*, *Satyrus* and a large number of *Noctuidæ*.—W. W. NEWCOMB, M. D.

A PALÆARCTIC NOTONECTA.—*Notonecta lutea* Müller has been heretofore known in the Old World only. It was described by this author in "Zoologia Dan. Prodrumus," in 1776. This work is not known to me, so cannot give the type locality. F. X. Fieber, in his "Rhyncotographieen" (1851), states that it occurs in Sweden, Austria, and Bohemia, in Europe; and in Asia, gives Barnaul and Irtysh in Siberia as localities. According to Kirkaldy, it occurs in Tammati, Finland, as well as in Bohemia and Siberia. In his "Synopsis Amphibicorisarum et Hydrocorisarum Fennicæ," 1875, p. 275, Prof. John Sahlberg comments on this waterbug as follows:

"Rather rare, but scattered all over Finland. I have found it farther north, near Sonostroff, in the southern part of Russian Finland (66°). Near Helsingfors it is rather common in clayey soils. It is distributed through Northern and Central Europe and Siberia."

However, what is most interesting in regard to *Notonecta lutea* is its distribution, and I now record it for the first time from America. It came to me with a number of other Notonectas from the Upper Columbia Valley, British Columbia. It is evident that we have here a true Palæarctic Hemipteron of wide distribution. The only other aquatic bug known to me to have a similar range is our common *Gerris (Limnoporus) rufoscutellatus*, which extends across Northern Europe and Siberia, and through British Columbia, down to Pennsylvania on the Atlantic coast.



*Notonecta lutea* Müll. is about the size and shape of *Notonecta irrorata* Uhler, but somewhat more convex in appearance, the dorsum being strongly arched. It approaches the latter bug also in the shape of the head and notocephalic outline. However, the entirely luteous color except in the costal margin of the corium, which has a dark strip, will at once distinguish it. In a paper in preparation will be given tables for separation of this insect and the other members of the genus.—J. R. DE LA TORRE BUENO, New York, N. Y.

I HAVE read with interest the comments and criticisms of Holland's Moth Book, and would like to add a few more of my own.

Plate xxiv, fig. 34, is *diffusa*, not *albilinea*. Pl. xxvi, figs. 8 and 9, should be reversed both in the reference to plate and also in the text. Fig. 5 of same plate is not *inquasita*. It is *impecuniosa*.

Plate xxx, fig. 15, is most probably *erectea* instead of *crassiuscula*, Plate xxii, figs. 23 and 26, represent ♀ and ♂ *Feltia volubilis*. This is all correct, only that, as the gray form is represented in one figure and the red-brown form in the other, it would give the novice the idea that the difference in color indicated the sex, which it does not, for I have both sexes in both colors. By the way, why has no varietal name been used to separate these very distinct forms? Hundreds of species much less worthy of such distinction have been named. Morrison, I believe, considered them to be distinct species, and named the dark form *stigmata*. Why can't this be used to-day? They are as well marked and separate as any two forms that I know of.

On page 337 Holland perpetuates Dyar's singular mistake in making *Epelis faxonii* a synonym of *E. truncataria*. There seems no good reason for such a mistake, for the two species are not at all alike.

On page 132, I cannot accept without protest his lumping *Apantesis nais*, *vittata*, *phalerata* and *radians* as forms of one thing, and dropping the name *nais* entirely. I have never seen one of which I had any doubt as to its identity. He says he has bred all forms from the same larvæ. I don't believe he ever got moths with black costa from parents with yellow costa. The black costa separates *nais* at a glance when other marks fail.

I also do not believe that *Apantesis rectilinea* and *phyllira* are anything more than forms of one thing, and yet Holland, following Dyar's list, has placed such totally unlike things as *arge*, *achaia*, *virguncula*, etc., between them. They differ in nothing except in the presence or absence of white veins in fore wings, and this is a very variable quantity, and with specimens enough I feel sure a complete gradation from one to the other could be shown.

There are many other minor errors of locality and orthography that I might mention, but this is already too long, so I will refrain from further comments.—E. J. SMITH, Natick, Mass.

TORTRICIDS OF NORTH AMERICA.—Will purchase large or small collections from all localities. Or will name and return promptly all known species, for privilege of retaining for study unknown species. Special object, publication of monographic work illustrating every species in color.—W. D. KEARFOTT, Montclair, N. J.

I NOTICE your plan regarding the announcements of work of special groups, and it strikes me as a very good one indeed. I may state that I have a synopsis of the Aradidæ for America north of Mexico in preparation and have in hand nearly all of the described species for this region. I would be glad to see specimens from different localities or receive locality records, and would be especially glad to see specimens of *Aradus ampliatus* Uhler, *abbas* Berg., *breviatus* Berg., *Aneurys politus* Say, *inconstans* Uhler, and *simplex* Uhler.—HERBERT OSBORN, Ohio State University, Columbus, Ohio.

THE infant son, two years old, of the famous entomologist, Prof. Nomenclature, had importuned his paternal relative for an additional piece of mince pie. Unfortunately his digestion was not equal to the task and the peripheral nerve endings in his ileum were irritated and reflexly caused nightmare. The infant's father was awakened by his mutterings and was amazed to hear him describe a curious insect with nine legs, two heads, four bodies and three and a half antennæ. He even detected a name which sounded like *Piea mincea*. The father described the insect in the next issue of the "Weekly Entomologist," and the generic and specific name appeared as *Piea mincea* Willie. This has all been predicted, but we must confess Prof. Nomenclature did not use much discrimination in adopting such methods of description, and especially such an inappropriate name. A name more accurately describing the insect would have been an improvement. See Can. Ent., xxxvi, 82, 1904.

ANOTHER WRONG DETERMINATION IN HOLLAND'S MOTH BOOK.—This time it is one of Prof. Smith's Noctuids and one of our most common species. Fig. 15 on plate xxx is labelled *Drasteria crassiuscula* ♂, but it is the male of *D. erectea*, the former species not being illustrated in either sex. This wrong determination has caused at least one collector trouble in trying to arrange his captures. When all have contributed their "mites" in the way of corrective determinations for the beautiful and valuable plates in Holland's Moth Book, I hope some one will arrange a list of such corrections.—M. V. SLINGERLAND.

THE POST OFFICE here has been changed from East End to East Falls Church, Virginia; express at Falls Church. Please note this change in my address as it is causing heaps of trouble.—NATHAN BANKS.

MR. CHARLES SCHAFFER of the Brooklyn Institute will revisit the Brownsville, Texas, region at a different season this year, thus hoping to get species not taken on a previous journey.

## Doings of Societies.

At the meeting of the Feldman Collecting Social, held April 20th, at the residence of Mr. H. W. Wenzel, 1523 South 13th Street, Philadelphia, twelve persons were present.

Mr. H. W. Wenzel exhibited oak twigs gathered on April 3rd, at Anglesea, N. J., infested by a small Hymenopterous insect, which seemed to confine itself to the young shoots of the trees. It belongs to the Cynipidæ. In reply to Mr. Harbeck, Mr. Wenzel stated that the color of *Cephennium corporosum* is quite variable in immature specimens.

Mr. Wenzel gave an account of an examination of muskrat nests at Anglesea, N. J. Sifting of the debris from several nests revealed only a small species of *Philonthus*. These nests were newly built, and he thought that later in the season they might contain more species of insects.

Mr. Boerner showed his collection of weevils.

Mr. Laurent spoke briefly on his recent Florida trip.

Mr. Boerner reported the capture of *Rhæbdoscelis tenuis* at Gloucester, N. J., on July 1st.

WILLIAM J. FOX, *Secretary*.

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The eleventh regular quarterly meeting of the Pacific Coast Entomological Society was held on the evening of February 20, 1904, at the residence of Miss Julia Wright, 2329 Pacific Avenue, Alameda, California. President Charles Fuchs in the Chair. Eleven members responded to roll call. Twelve visitors were present. One new member was elected.

Mr. Charles Fuchs read a paper on the "Habits and Value of the *Coccinellidæ*." Mr. Fordyce Grinnell followed with a short biographical sketch of Pierre Joseph Michel Lorquin, "An Early California Collector." Mr. L. E. Ricksecker stated that *Dromæolus californicus* (Elateridæ, subfamily Eucneminae) is found on Spruce, while the food plant of *Dromæolus hospitalis* is the Alder.

Dr. E. C. Van Dyke stated that he found both *D. humeralis* and *californicus* on pine and spruce, and that Douglass' spruce is probably the food plant.

Mr. Francis X. Williams stated that he found the weather very cold in June at Echo Lake, Shasta County, California. Took a number of Carabidæ and Buprestidæ. A few Lepidoptera—*Thecla dumetorum*, *Lycæna podarce*, and *Sphinx perelegans*. The country is rocky above the Coniferous belt, the Manzanitas predominating. *Chionobas* were taken there.

Miss Julia Wright exhibited a box of Tasmanian Coleoptera and F. W. Nunenmacher *Hylotrupes ligneus* and *Polycaon* sp.

F. E. BLAISDELL, M. D., *Secretary*.

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A regular meeting of the Entomological Section of the Chicago Academy of Sciences was held April 21, 1904. Eleven members present. Mr. Kwiat donated a small box of miscellaneous insects including some of his captures at Osborn, Ind., on April 17th.

The subject of the evening—a talk on Fossil Insects, by Prof. S. W. Williston followed. He gave a resumé of the introduction and distribution of fossil insects, the conditions of fossilization, and the relationships of the early forms. His remarks were illustrated by specimens from the Carboniferous of Mazon Creek, from the Solenhofen beds of Bavaria, and from the Eocene of the Rocky Mountains. He expressed regret that so few students of entomology have become interested in fossil insects, a most fertile and largely unworked field, especially in America. Fossil insects he has found to be much more widely distributed than is generally believed, and although the field is one of peculiar difficulties, is sure to be rich in results.

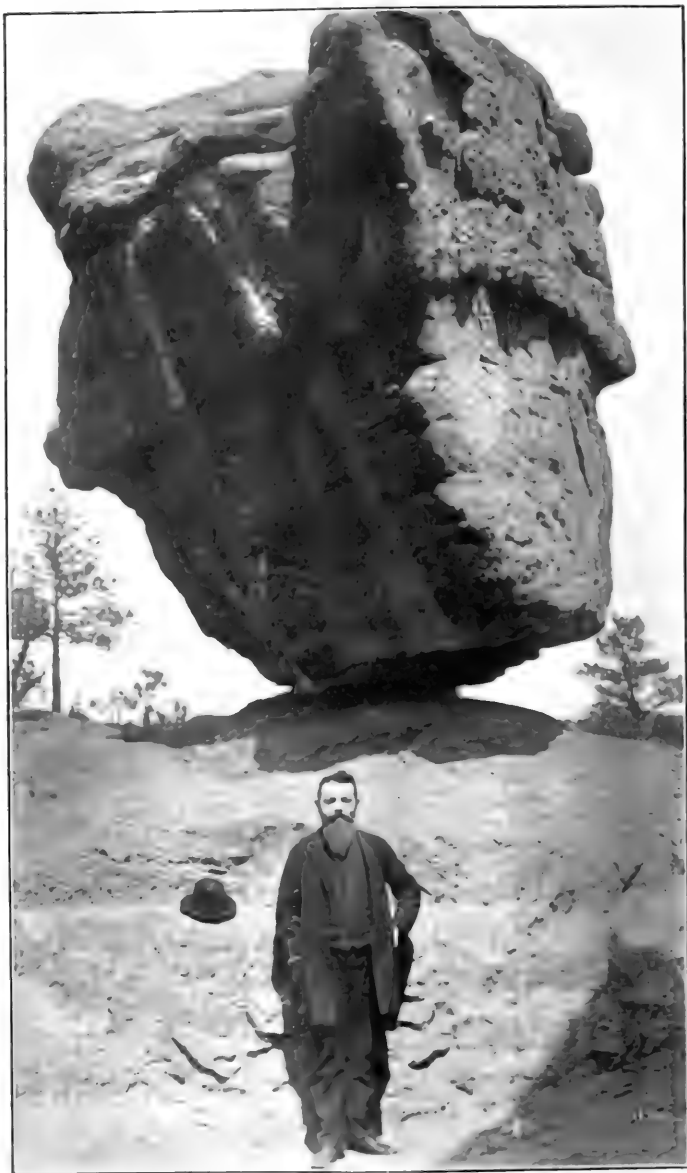
ALEXANDER KWIAT, *Recorder*.

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### Rev. Fr. Jerome Schmitt.

It is with great regret that we announce the death of the Rev. Father Jerome Schmitt of Beatty, Penna. The deceased was a Professor in St. Vincent College. He was born in Neuhausen, Wuerttemberg, Germany, May 30, 1857. A more extended notice with portrait will appear in September NEWS.

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REV. FR. P. JEROME SCHMITT.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XV.

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No. 7.

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### The Rev. Jerome Schmitt, O. S. B.

(Plate XV.)

Father Schmitt died at the Mercy Hospital, Pittsburgh, April 27th. He was born at Neuhausen, Wuerttemberg, on May 20, 1857.

He entered the Scholasticate at St. Vincent's College, Beatty, Pa., July 5, 1869. Having successfully completed his clerical studies, Father Jerome, in July 1875, entered the novitiate of the Order. In 1881 he was ordained priest, and assigned to teaching Latin and Greek in the college course. In 1899 he was appointed Subprior. Official duties were not to his liking, he claiming his temperament ill fitted him to be a superior. He therefore importuned the Rt. Rev. Archabbot to relieve him, and when this was done, at the end of his first year's service, he announced the fact with childlike glee to his brethren, introducing himself as the very Reverend Ex-Subprior. He had eminent musical talent and was an old-time and reliable member of the college orchestra, which now feels his loss keenly. Almost thirty years ago he began the study of entomology and succeeded in reaching the foremost rank among men devoted to this branch of natural science. His specialties were the Formicoidea and among Coleoptera the families Scydmaenidæ and Pselaphidæ. In regard to the latter particularly his studies and observations were well known

to his fellow workers, and they spoke of him as a keen student and able collector. His work was well known to men like Prof. H. F. Wickham, H. W. Wenzel, Prof. W. M. Wheeler, the Rev. E. Wasmann, the renowned Jesuit scholar and scientist, and Prof. Emery of Bologna, who all regarded him with respect and who were frequently indebted to him for valuable material. His biographer in the *St. Vincent's Journal* says: "May the memory of our dear Father Jerome and his well-spent life ever live in the hearts of his pupils, confreres and friends, and incite them to a generous emulation of his many noble qualities of heart and mind."

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### Robert M'Lachlan.

(Plate XVI.)

Robert M'Lachlan, chief of the British Neuropterists, monographer of the European Trichoptera, died at Lewisham, London, May 23, 1904. He was the son of Hugh M'Lachlan, of Greenock, and was born April 10, 1837, near Ongar in Essex, and educated chiefly at Ilford. He early acquired an interest in botany, subsequently in entomology, and the inheritance of sufficient means from his father enabled him to devote his life to scientific pursuits. As a lad of eighteen he made a voyage to Australia and China, and brought back a large collection of Australian plants. In 1896 he wrote of himself, "I have travelled much in Europe, but more as a collector than a tourist."

His interest in the Neuroptera (in the Linnæan sense) dates from the later fifties. In the sixties he successively monographed the British Trichoptera, Planipennia and Psocidæ, followed by a catalogue of the British Neuroptera in 1870.

All agree that his chief work was the *Monographic Revision and Synopsis of the Trichoptera of the European Fauna*, a volume of 630 pages and 59 plates containing about 2000 figures, many of which illustrate structural details from his own camera drawings. Published in parts from 1874 to 1880, it cost him almost eight years of constant work, he told the writer. A *First Additional Supplement* of 80 pages and 7 plates appeared in 1884.



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ROBERT M'LACHLAN.

In 1864, with T. Blackburn, H. G. Knaggs, E. C. Rye and H. T. Stainton, he became one of the first editorial board of the *Entomologist's Monthly Magazine*, surviving all of these associates and continuing in that capacity to the time of his death.

Since 1884 many papers on British and exotic Neuroptera have appeared from his pen. The Perlidæ and Ephemeriidæ, alone of the group, appear to have been untouched by him.

For many years he lived at 23 Clarendon Road, Lewisham, in the southeastern part of London, where was to be found the largest collection of native and foreign Neuroptera in the British Isles, far exceeding that of the British Museum. Here were to be seen, in the summer of 1895, when the writer first made his personal acquaintance, great stores of Odonata, European Planipennia, Ephemera from all parts of the world, including the types of the Rev. A. E. Eaton, the Trichoptera on which the great European Monograph was based, and many extra-European Planipennia and Trichoptera. Many acknowledgments for the loan of dragonflies from this mine are contained in the works of Baron de Selys-Longchamps, and the latter, by his will, left a considerable sum of money to M' Lachlan, who in return was to work out the Selysian collections. The devisee, however, declared this "utterly and totally impossible," and at once renounced all right to the money.

M' Lachlan was equally liberal in affording use of his material to others and, as readers of the NEWS have had opportunity to observe, he voluntarily sent a number of his unique types through the dangers of a trans-Atlantic voyage to contribute to the greater completeness of the Odonate part of the *Biologia Centrali-Americana*, while previously not a few of his duplicates had made their way to find a home (permanently, it is to be hoped) in Philadelphia.

M' Lachlan took a considerable interest in general scientific questions, as one may learn from Darwin's citations from his papers and correspondence in the *Descent of Man*.

He took an active part in various scientific associations, being a fellow of the Entomological, Linnæan, Royal, Zoological and Royal Horticultural Societies in London; of the Entomological Society he was Secretary 1868-72, Treasurer

1873-75, 1891-1904, and President 1885 and 1886. As Corresponding or Honorary Member, his name appeared on the lists of the Entomological Societies of Philadelphia (elected 1866), Belgium, Holland, Sweden, Switzerland, and others.

Twenty-four years younger than the great Belgian master, he has followed him within four years. *The captains and the kings depart.*  
P. P. C.

### Micro Cyanide Bottles.

BY CHARLES STEVENSON, Montreal, Que.

Mr W. D. Kearfott, in his suggestions on collecting Micro-Lepidoptera recommends "the common test-tubes, which can be purchased in any drug store," for use as cyanide bottles (ENT. NEWS, xv, 4, p. 128). These, as he states, are very fragile, and necessitate great care in handling; for in breaking (which they will often do with the pressure of inserting the cork), they are liable to badly cut the hand or maim the fingers, and probably produce serious results if the wound could not be treated immediately, as mentioned. This drawback can be overcome by using a test-tube not generally heard of outside a chemical laboratory, usually called "ignition tubes," made of Bohemian infusible glass. These can be obtained in the size recommended. They have a thick wall and are very strong.

They also have the advantage of having the mouth much more flared. They cost more, about ten cents each, but are worth it when one runs the risk of having his hand in a bandage for many days by using the common tube—not a very desirable circumstance in the midst of the collecting season, especially to a student of micros. Druggists do not usually stock them, but they should be obtainable from any dealer in chemical apparatus.\*

Another suggestion,—corks have a faculty of disappearing at inopportune moments. By attaching the cork with a piece of string to the tube, this cause of much worry, perhaps loss of valuable specimens, and inelegant language would be avoided.

\*The writer will gladly supply fellow entomologists unable to get them, with an address where they can be obtained.

## Notes on the Orthoptera of the Keweenaw Bay Region of Baraga County, Michigan.

BY JAMES A. G. REHN.

During the summer of 1903 Mr. Morgan Hebard, of Chestnut Hill, Philadelphia, spent considerable time collecting Orthoptera in the vicinity of Pequaming, Baraga County, Michigan. On his return, Mr. Hebard very kindly turned his entire season's work over to me for determination, and also presented the Academy of Natural Sciences with a very representative series.

As the northern peninsula of Michigan has figured little in entomological literature, Mr. Hebard has, at my suggestion, prepared a preliminary account of the region from which the collections were made, thus forming a basis for future remarks on the region. Groups of insects other than the Orthoptera were by no means neglected by Mr. Hebard, and it is to be hoped that reports on the other orders may soon appear. Mr. Hebard's notes are all given in quotation marks, and all statements thus designated should be credited to him.

"Pequaming, Baraga County, Michigan, is a small lumber town situated on a point of land which juts out into Keweenaw Bay, nine miles from its head. It is about twenty miles distant from the famous Upper Peninsula copper country, most of which lies to the north on Keweenaw Point. The town is on the southern shore of Pequaquawaming Point, and is therefore protected from the tremendous northeasterly gales which, at this point, have a clear sweep across Lake Superior of over one hundred and forty miles.

"Pequaquawaming Point is almost oval in shape (the Indian name signifying 'wooded oval') and is parallel to the mainland, from which it is separated by an open marsh three-quarters of a mile wide by one and one-half miles long. This marsh is in most places an open meadow of tall marsh grass dotted with tamaracks; but along the edges these tamaracks form a dense growth intermingled with white cedars. Wherever there are tamaracks it is safe to venture; for, although one sinks a foot or so at every step into the sphagnum, cranberry,

pitcher-plants and others which grow in these places, the roots of the trees seem to form a solid network underneath, but in the open places the grasses grow on a thin mat of decayed vegetable matter, under which there is nothing but ooze for many feet.

“On the other side of this marsh a series of heavily wooded hills, in most places more than one hundred feet high, stretch toward the northeast more than sixteen miles, forming Point Abbaye, which is very wild and almost entirely covered with a virgin forest of hemlock, pine and hardwood trees and in some places by dense cedar swamps. The gloom of the forest under the far-reaching boughs of great trees is not inducive to Orthoptera, but game is abundant. Bears, wolves, lynx and wildcats are known to inhabit these forests, and deer are abundant. A lynx once followed me for quite a distance when I was out bound for the hemlocks in search of *Podisma*. Across the marsh, along the foot of the hills, a brule (a tract of woods which has been killed by fire) extends for over a mile, now covered in many places by a vigorous young growth of aspen; but, where the charred trunks are still standing, the underbrush is chiefly composed of hazel bushes and raspberry vines. In this place, where the sun has easy access to the ground and the grass is consequently abundant, I found the collecting to be very good. The country back of the nearby towns of L'Anse and Baraga is heavily wooded except in the vast tracts where forest fires have swept through, leaving nothing but charred remains; there are also many farms, as the soil, although in most places stony, is very fertile. The L'Anse et Vieux Desert Chippewa Indian Reservation extends along the shore of Keweenaw Bay between Pequaming and L'Anse, and in the pastures of the Reservation I found the collecting to be of the best. On the north the Pequaming marsh is separated from the lake by a narrow strip of sandy soil, covered with Norway and white pines and carpeted with huckleberry bushes, arbutus and other sand-loving plants; but the only insects to be found there were a host of dragonflies, a few beetles and the scarce butterfly, *Colias interior*. On the south this marsh extends almost up to

Pequaming Bay, leaving just room for the wagon road from Pequaming to L'Anse. Along this road, among the driftwood, the Orthoptera fairly swarmed. The geological formation of Pequaming Point is of three distinct varieties; the end on which Pequaming is situated was formed by the action of water, which piled a great mass of boulders and stones; a very small amount of earth now covers these, and consequently the surrounding pastures are rocky; the ground rises a short distance from the town, and it is there that the cliffs of soft red sandstone commence; a little over half a mile further out the stone changes abruptly to a much harder gray sandstone; the vegetation is, however, not affected, the top soil being all the same. The point is covered with a dense forest, in the higher and drier portions composed of maple, birch, oak, balsam, spruce, hemlock and pine,—the maple greatly predominating and the conifers much scattered. In the swampy portions the woods are denser and there is considerable white cedar. Over all the undergrowth is so dense that in hardly any place can one see more than fifty yards through the forest. The undergrowth is chiefly soft maple, balsam and hazel, and the ground is carpeted with ferns, lichens, mosses and grasses. The most beautiful tree in the fall is the mountain ash, when its clusters of bright red berries contrast splendidly with the green woods.

“I found the Coleoptera collecting splendid in the clearings here and there in the woods, but Orthoptera were scarce excepting in the fields and along the roads.”

The specimens simply credited to “Baraga Co.” are from points within a few miles of Pequaming, such localities being without geographic names and but slightly different from the other localities mentioned.

The general character of the Orthopterous fauna of this region is distinctly Boreal, practically no trace of Carolinian or Sonoran types being found. This is, of course, fully in accord with the evidence of the mammals and birds of the section.

#### BLATTIDÆ.

#### *Periplaneta americana* (Linn.).

“One immature specimen, taken in store, June 30, 1903.”

## ACRIDIDÆ.

**Acrydium granulatum** Kirby.

Twenty-four specimens; fourteen males, ten females. Pequaming, July 2, 5, 8 and 10 (marshy woods and swamps), L'Anse et Vieux Desert Reservation, September 4 (meadow). Baraga Co., August 21, 29 (woods, swamp).

"Moderately common in early July, about marshy spots on logging trails. They diminished rapidly in numbers, and by the middle of July had almost completely disappeared. I found them to be again somewhat plentiful about the end of August. They were very active, springing several feet, and, owing to the many shadows cast by overhanging branches of trees, they were very hard to follow and locate. I took but three specimens on high ground; these were taken in stony pasture on the Indian Reservation, on September 4th. The ground color of the majority was dark brownish or grayish; sometimes, however, the whole pronotum was a rich cream color. The pronotum was in many cases ornamented with two or four irregular, intense brown or black spots, and a white or cream saddle-like marking occasionally occurred in front of these, giving the insect a strange appearance."

These remarks also apply to the following species.

**Acrydium acadicum** (Scudder).

Three specimens; two males one female. Pequaming, July 5 and August 1 (marsh and cedar swamp). L'Anse et Vieux Desert Reservation, September 1 (meadow).

These specimens exhibit three color phases; one sooty black, another vinaceous cinnamon, with the lower surface, face and sides suffused with blackish, and the last with a median ochraceous bar on a blackish ground, relieved laterally by a pair of median, crescentic, velvety-black maculations. The latter type of coloration is very similar to that found in some specimens of *A. granulatum*.

**Chloealtis conspersa** Harris.

Twenty-two specimens; fifteen males, six females. Pequaming, July 2, 4, 7, 9, 18, 20, 22, 23, 26, 31; August 12, 17 (latter, on pine in meadow). Baraga Co., Aug. 30.



“At the beginning of July, when I arrived in Pequaming, the males of this species were rather common about brush heaps and stumps in open fields and pastures; I also took a few specimens in the woods, but they are sun-loving creatures and could never be found except in sunny spots. They soon diminished in numbers, and after August 1st hardly any were to be found. The first female was taken on July 7th. Only six females were seen during the entire season; four were taken on beds of dead leaves in the woods, one among the loose bark at the foot of the dead Norway pine which I visited so frequently and successfully in search of Coleoptera, and one in the road where it passes through meadows of tall grass. The females were very easy to capture when found; they are, of course, unable to fly, and their jump lacks entirely the elasticity so characteristic of the males, and is similar to but weaker than that of a female *Dichromorpha viridis*, which at a distance they somewhat resemble. The males, on the other hand, are, I think, about the best jumpers of any of the Orthoptera found in the eastern United States. They have a powerful spring, but it is their quickness which renders them so difficult to capture. When alarmed, they are not content with one spring to a place of apparent safety, but jump about with such speed that they can hardly be followed with the eyes, and never cease their rapid succession of jumps until deep under the nearby vines, twigs, or dead grasses, where they cannot be induced to stir, and owing to their color are perfectly safe. I have never seen a specimen where there was not a thick tangle somewhere near in which to hide. I was only able to catch them by listening until one of the musicians gave his “tsikk-tssikk-tssikk-tssikk-tssikk-tssikk,” which was always lustily delivered; then, approaching within a few yards, I would wait, knowing that, if not as yet alarmed, the sound would be repeated in a few seconds; then, locating the sound, I would approach to within a few feet; even then it would be usually impossible to see the musician, and it would be necessary to wait motionless. If my approach had been sufficiently stealthy, the musician would at length disclose his position by giving a cautious “tsik.” Pouncing upon him

while busy stridulating, I could usually take him before he could get in position to spring. So keen and shy are they, however, that often, after a careful advance, occupying several minutes, the singer would notice me when still several feet distant, and would not again make a sound, no matter how long I remained motionless.

"Their mode of stridulating closely resembles that of *Chorthippus curtipennis*; the sound produced is, however, far stronger.

"The males are brilliantly colored, the black lateral lobes of the pronotum and the coloration of the hind femora being very striking. The females, when resting motionless, greatly resemble a grayish twig, which resemblance is considerably augmented by the decidedly truncate abdomen."

These specimens are of the same general size as individuals examined from De Grassi Point, Ontario; Vermont; Norway, Maine and "Penna.," but considerably smaller than a pair from the cedar bogs of northern New Jersey. These latter are enormous, considerably exceeding specimens of *C. abdominalis* in size. One female specimen, taken on pine, August 17th, belongs to the long-winged form called *prima* by Morse, the tegmina and wings reaching slightly beyond the tips of the posterior femora.

***Chloealtis abdominalis* Thomas.**

Seven males. Pequaming, August 12 and 21 (meadow). L'Anse et Vieux Desert Reservation, August 20 (road along lake shore), September 5 and 6 (meadow).

"I took but seven specimens of this species; all males. They were taken in August and early September along the lake shore. On September 5th two were captured while stridulating on the top of some decked hemlock logs. They were very spry, somewhat resembling in their movements and the sounds which they produce the males of *conspersa*. More specimens could easily have been taken."

Mr. A. N. Caudell of the U. S. National Museum has very kindly compared one of these specimens with males of this species from the northwestern States, and finds them identical.

The collection of the Academy contains no representative of the male sex.

The occurrence of this rather western type was not unexpected, as E. M. Walker recently found the species on the Severn River, Ontario.

***Chorhippus curtipennis*** (Harris).

Seventy specimens, about equally divided between the sexes. Pequaming, July 9, 10, 14, 16, 27, 31, August 1, 5, 6, 8, 9, 17, 21, 28, 31, September 2, 3, 5, 6 (meadow, swamp). Silver Creek, August 27. Brulé on mainland opposite Pequaquawaming Point, July 20 and 22. Baraga Co., August 20, 21, 24 and 30 (meadow, barrens near marsh).

"This species first appeared in early July, and by the middle of the month was very common in all meadows of tall grass. It was also to be found in brulés and along roads where the grasses grew high, but never in the woods. It was still very plentiful when I left Pequaming (September 8th), but probably disappeared before the end of the month on account of the cold and frosts. The males are fairly good jumpers and also fly, but the females are unable to fly owing to their short wings, and appear very awkward in jumping.

"This species was never to be found in numbers except in meadows of tall grass, but there it fairly swarmed, and I was able at any time to take a dozen or more with a few sweeps of the beating net. The males always attempted to escape by jumping and flying, the females by hiding under the grass. This species was by far the most plentiful around Pequaming during almost the entire season."

About one-third of the series belongs to the extremely short-winged type, but quite a few intermediate between the two extremes are present. The coloration shows very great variation, as is usual in the species.

***Mecostethus gracilis*** (Scudder).

Fifty-six specimens; fifty males, six females. Pequaming, August 1, 3, 5, 6, 8, 12 and 21.

"I found this species in but one locality, where, however, it was abundant for a month. It was a clearing of several

acres in the woods, less than a mile distant from Pequaming. The grass growing over the lower portion of this clearing is very thick and high, and it was in this that I found *Mecostethus* for the first time, on the first day of August. On going to this clearing on the morning of that day a new sound met my ears,—a loud, harsh, connected stridulation, repeated at intervals of a few seconds. Following these sounds up, I was at length able to procure several specimens of this beautiful locust. They had all very recently emerged, as indeed all the many specimens I caught a few days later. They were easy to capture with the net as they flew up, but when they hid in the grass, as they often did on alighting, they were almost impossible to find, as they blended exactly with their surroundings. The females did not appear till a week later, and, at the best time of the season, a morning's search would never reveal more than two or three of them; they were very lubberly and could hardly jump. By September 1st almost all had disappeared, and only a few specimens remained of the August host. Life colors:

“♂. General color:—Rich grass green, beautifully shaded and contrasting strongly with the rich carmine of the inner surfaces of the hind femora.

“♀. General color:—Yellowish brown, red inner surfaces of hind femora much paler than in the male.”

Considerable variability in the length of the tegmina is exhibited in this series, some males having the tegmina considerably exceeding the posterior femora in length, while others have the femora but little surpassed by the tegmina. The females, of course, have this variability very marked.

***Camnula pellucida*** (Scudder).

Fifty-two specimens; twenty-nine males, twenty-six females. Pequaquawaming Point, August 13 (meadow). Pequaming, July 9, 10, 11, 12, 14, 18, 23, 26, August 1, 8, 12, 18, 20, 21 and 31 (meadow, tamarack swamp). L'Anse, July 23 (meadow). Baraga Co., September 5 (meadow).

“This species first appeared on July 9th. They were common enough at the outset and increased in numbers till, by the middle of the month, they were swarming in almost every

dry pasture of short grass. In these localities they rose in swarms, flying low and swiftly for usually from twenty to thirty feet. They flew up so vigorously that single specimens were difficult to take, even with a net; and, had they not been so very common, it would have taken a considerable time to collect a large number. As it was, I could get a dozen or more in my net by sweeping the ground in front of me as I crossed a pasture. I have seen a specimen, when pursued, keep up a sustained flight of more than two hundred feet, never rising more than four feet from the ground, but flying more swiftly than one could run. The general color of these specimens was almost always light brown; two specimens, however, which I took, were so dark that the markings were hardly noticeable."

A considerable range in intensity of coloration is presented by this series, some specimens being extremely light-colored.

**Hippiscus tuberculatus** (Palisot).

Two males. Pequaming, July 6 and 18.

"During the season I saw but two specimens, both of which I took. They were males, and were easily captured with the net. The first was taken in a garden on July 6, the other on driftwood along the lakeshore on July 18th, more than a mile distant from the place where the first specimen was taken."

These two individuals are much darker and more uniformly colored than eastern specimens, a fact which has also been noticed by Scudder regarding specimens from Nepigon, Ontario, across Lake Superior. The intensity of the lemon-yellow humeral vitta of the tegmina is very striking.

(To be continued.)

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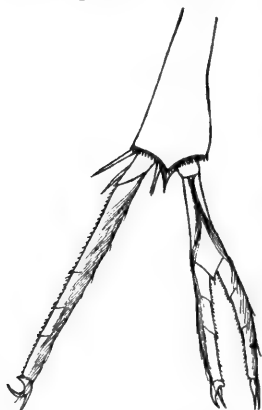
## Reduplication of the Tarsus in *Hydrocharis*.

BY H. F. WICKHAM, Iowa City, Iowa.

Not long since, I received from Mr. Norman Criddle a specimen of *Hydrocharis obtusatus* Say, which he had taken near Aweme, Manitoba. The insect presents a remarkable struc-

ture, which should be placed on record, the literature of this subject being none too voluminous.

The abnormality manifests itself in the right hind leg; the coxa and trochanter are normal but the femur is more flattened beneath than its mate. The tibia is a trifle longer than it should be, the outer edge almost straight, the inner edge curved, tip dilated, the upper apical margin produced into a sharp point. From this dilated apex, which of course represents the consolidation of a pair of tibiæ, springs, first, a tarsus which is nearly normal except that it is slightly undersized, and, second, a paired organ (external to the first), which is composed of two tarsi united at base. The basal joint



of this paired organ is broader than that of a normal tarsus, the second joint is twice as broad at apex as at base and is furnished at tip, in the middle line, with a bunch of small spines. From each side of this broad apex arises a well-formed ramus of three joints, the terminal ones bearing each a pair of normal claws.

Instead of the usual number of tibial spurs (two) we find that this leg bears three. The two internal ones, which may be assumed to represent the normal pair, do not differ essentially from those of the other leg, but the third, which is located on the middle of the inferior apical margin, is trifurcate at tip.

The accompanying figure is rather diagrammatic, but will show the general arrangement of the parts described. It will be noticed that the opposed surfaces are correlative or nearly so. They appear to occupy the position DAA of Bateson's scheme, illustrated on page 481 of his work, "Materials for the Study of Variation." The composite structure of the second joint of the supernumerary tarsus is well shown by the disposition of the hairs on the upper surface and of the small spines on the lower. Only the former appear in the figure, which shows a view from above.

## Protective Resemblance.

BY R. E. KUNZE, Phoenix, Arizona.

Having during the past nine years extensively collected of the insect fauna of Arizona, some striking observations of the means resorted to by insects for purposes of self-protection have presented themselves. Insects suddenly started up from a place of rest or after pursuit of an enemy, will instinctively drop into a place of concealment, which it is difficult to detect. Many Rhopalocera rifle the flowers which most nearly agree with the colors of the upper surface of their wings, while others, with folded wings, admirably succeed in escaping detection.

Near Tucson I observed *Terias mexicana* feeding on flowers of *Acacia ficina*, a perennial plant two feet high, bearing white flowers and growing on the banks of ditches. This *Acacia* much resembles a sensitive plant, and affords ample protection to *mexicana*. Flowers the size of a thimble cover the axillary space of the leaf, and the greenish yellow of the insect is well protected by many bipinnate leaves and blossoms. *Anthocharis pima*, the earliest of our diurnals which flies in Maricopa County, alights on the yellow blossom of *Anisnickia spectabilis*, a hirsute annual found on sides of mountain and tableland. The small flowers crowded at the point of short racemes furnish a secure place for our golden *pima*. *Helenium hoopesii*, hardly distinguishable from the eastern elecampane, affords a safe retreat for *Gnophæla discreta*. This day-flying moth rests on the brownish-black disk of the larger yellow flowers, and when disturbed takes refuge on another flower of *Helenium*. Toward evening I have observed as many as three and four *discreta* resting on a single flower, so that one could push several into a cyanide bottle with perfect ease. This plant is found in moist canyons or near springs, at an altitude of 9,000 to 10,000 feet on the San Francisco Mountains, near Flagstaff. Another day-flying moth, *Melanchroia inconstans*, feeds on this same plant, and its bluish-black color quite harmonizes with the disk of *Helenium*. *Inconstans* is a little wary geometer, very hard to approach in the hottest sunshine, and I had to secure all with a net secured to an extension pole. Higher up on the mountain I have noticed *inconstans* resting

on the dark disk of *Rudbeckia laciniata*, another large yellow-flowered composite plant.

The orange-colored flowers of *Asclepias tuberosa*, well named the butterfly-weed, furnish nectar for *Argynnis nausicaä* and *Lemonias nais*, in the early part of the season, and are quite protective to these insects. At the headwaters of the Hassayampa these insects are found, and of *nausicaä* I have only seen two other examples near Flagstaff. So far I have not met with any other species of *Argynnis* in this territory. *Pieris protodice* is usually found on *Nasturtium officinale* or watercress, and when this plant is out of bloom may be looked for on the white flowers of *Dithræa wislizeni*, a crucifer found in the bottoms on the sandy banks of streams. This plant has very glaucous leaves and stems, flowers several times during the year, from early February until December, and is a favorite food plant of *protodice*. Rarely have I observed this white insect alight on any other colored flower.

*Thecla apama* feeds on the white flowers of *Ceanothus fendleri*, and when disturbed seeks refuge among the foliage of the same shrub. The bright green of the reverse side of the wings agrees perfectly with the color of the leaves. When frightened, I have seen it alight on the needles of *Pinus ponderosa*, if a bush of *Ceanothus* stood not conveniently near. *Apama*, with its wings folded, defies detection, illustrating mimicry in the fullest sense.

*Pamphila bellus*. This bluish-black skipper, with yellow fringe on its wings, is usually feeding on the prominent yellowish cones of *Rudbeckia laciniata*. It is not often observed on any other but this cone-flower. *Eudamus cellus* is its companion in the Huachuca Mountains, rifling the yellow flowers of *Rudbeckia*. On this flower *bellus* seems to be less protected than *cellus*.

*Libythea bachmani*, when frightened off the white flowers of *Baccharis emoryi*, an evergreen shrub, on which it feeds in September, selects for refuge the dry stems of the same plant, and with closed wings it is not easily discovered. The gray color of the dead twig and that of its wings on reverse side makes it wonderful to behold.



*Cyphus placidus*, a light green Curculionid of an almost glaucous color, a rare insect of Arizona, is one of the beetles defying detection. In September, 1898, I was entomologizing one day with the late Dr. H. G. Griffith, who came here to recuperate. We had collected species of *Nemognatha* from sunflowers, and *Crossidius intermedius* from *Ludvigia hardwickii*, when of a sudden, on our return to town, with an exclamation of joy and surprise, the doctor picked a *placidus* from the lappel of his coat, which in brushing through the net had dropped thereon. We made repeated search among the plants examined but could find no more. Subsequently I found the second *placidus* resting on flowers of *Ludvigia hardwickii*, the flower or leaf of which was not protective. Next to it grew a bush of *Atriplex torreyi*, the color of which in foliage and stem fully agreed with this beetle. I beat the bush vigorously and secured another such Curculionid, and from this time onward have succeeded in taking a few every year or two. I have often tried to discover this beetle on bushes from which it was obtained by beating, but very seldom succeeded. This Curculionid clings to the glaucous stem, which is of the same tint as the entire insect, and also agrees with the color of the leaf.

*Ludvigia hardwickii* is an evergreen shrub in this valley, producing yellow flowers at the point of each branch. This flower, appearing in dense masses is the host of *Crossidius intermedius*, a longicorn of a buff color with a black stripe between the elytra. This beetle is hidden between the closely appressed flowers, so that only its head and antennæ appear above the level of the flowerhead. The long antennæ serve to recognize this insect, which, on account of color and method of concealment, is rarely observed by anyone except an entomologist. The red cup-shaped flower of *Sphaeralcea ambigua*, growing in desert arroyos, is the host of *Trichodes ornata*, a beautiful red and black beetle. The environment is quite protective in every sense to this finely colored insect, a variety of which is black and yellow in ornamentation.

The disk of the ubiquitous sunflower is a favorite place for species of *Nemognatha*, especially *luridus*, and *Gnathium*

*minimum*. These flower beetles prefer *Helianthus* to any other yellow composite, inasmuch as the yellowish or buff color harmonizes with the host. The most of our Malachidæ are found on the pale yellow flowers of *Prosopis juliflora*, or mesquite, especially in a season when there is a good honey flow. The color of flowers and insects is very similar.

That brilliant little Curculionid, *Magdalis lecontei*, if rightly informed, I always found on the needles of young *Pinus ponderosa*, high up in the Pinal Mountains. The iridescence of this beetle, predominating in a greenish violet, affords much security in the clustered needles of the pine. It flies in July. On the young shoots of the same pine I found *Polyphylla variolosa* in hiding. Before the expansion of the leafbud it is of a reddish-brown color, protective to this chestnut-colored June-bug. On the same young shoots I found a good-sized red Longicorn, the name of which I have forgotten, and which is quite uncommon. A lobate-leaved *Quercus*, as well as the leaves of the mountain walnut, just as dusk sets in, attracts the 'emerald *Plusiotis lecontei*, which this "gold-bug" as it is called in Arizona, alights on. *Plusiotis gloriosa*, popularly known as "silver-bug" in Yavapai County, because of the silvery stripes on its green elytra, prefers the glaucous leaves of *Juniperus occidentalis*, var. *monosperma*, which more nearly harmonizes with this beautiful beetle. The leaves of this juniper are silver-tipped and the young foliage is tinted bluish-green. *Plusiotis worthii*, another great rarity, I took a few of in the Huachuca Mountains, found resting in bright sunshine on the leaves of an evergreen oak, *Quercus emoryi*. The color of *worthii* is a glossy pea-green with lavender legs; it is as large as *Polyphylla variolosa*. The green glossy leaves of this oak are in perfect touch with this fine insect.

*Psiloptera drummondi*, a black Buprestid with an orange stripe across the thorax, affects the brown stems of old mesquite bushes during September, and is not readily observed until it moves around the branch trying to elude the pursuer. *Chrysobothris 8-punctata* often is found in company on the same host, its dark-brown color agreeing with the mesquite bark. A much larger Buprestid, black with a purplish sheen,

and when fresh yellow-dusted, is resting on the green branches of *Parkinsonia microphylla*, otherwise known as the "Palo Verde" of our desert. The latter is a small tree from ten to fifteen feet high, and this beetle has a fondness of resting on the higher branches of this thorny *Parkinsonia*, so that we have to use a net fastened to an extension pole. The much smaller *Sphænotica saturnalis* rests on dead branches of the same wood, the darker color of which is quite protective. Another fine Buprestid, *Gyascutus obliteratus*, heavily dusted with yellow powder, and the ground or body color being of a greenish-gray, is found on young "Palo Verde," the stems of which are bright green. Under a glaring hot sun in May or June this beetle is very alert, and a silken net is soon torn to pieces by the long thorns of this shrubby tree. The bark and thorns of very young "Palo Verde" much resemble *obliteratus*.

The highly polished black *Acmaeodera gibbula* Horn, which has a row of scarlet spots on the outer border of the elytra, I take early in April on the leafless branches of *Acacia greggii*, known as the "Cat's-claw bush" in Arizona. The bark of this *Acacia* is brown, covered here and there with dead epidermis, especially in the fork of branchlets. This *Acmaeodera* clusters around these blackish spots and is not easily detected. Frequently it rests on the tip end of a branch. I gave some of these beetles to Dr. H. G. Griffith when he collected here, who sent them for determination to Mr. Fall, and the latter returned them as nov. spec., labeled *A. griffithii*. My insects had been previously compared with *gibbula* of Dr. Horn's collection, and so named.

The green branches of *Salix occidentalis* furnish the feeding place of that handsome *Chalcolepidius smaragdinus*, the most brilliant elaterid of Arizona. *Smaragdinus* is a gem of great rarity, and very uneasy when detected. *C. webbia* and *C. tartaricus*, both of bluish-green with a border of white hair around elytra, affect any kind of a willow branch, and even suck the sap from a wounded limb.

Probably for safety, *smaragdinus* ascends to the topmost branches, always the greenest of willow. When frightened it alights on the broad leaves of *Salix*, and quickly runs up the

stem, where the color is most protective. The shaking of a limb in ascending a tall willow quite often causes this *rara avis* to take flight, to the dismay of a collector.

A large green grasshopper, *Schistocera shoshone*, in the early part of summer, is found hiding among the green foliage and resting on a green stem of mesquite. Later in autumn it affects the leaves of cottonwood,—*Populus fremontii*,—as well as of *Salix fluviatilis*, the only trees and shrubs retaining green leaves until the latter part of December, in the Salt River Valley. There *shoshone*, as well as a *Xiphidium*, find a secure resting place.

Numbers of Mantids of many hues,—carneous, green, gray and brown,—select the leaves or stems of plants in unison with their own colors, and usually fully illustrate color protection. *Mantis religiosa*, quietly and patiently, with uplifted forelegs, may be noticed awaiting the approach of some other insect, and pounces upon it like a tiger upon his prey. This peculiar attitude has been likened by Mexicans to a child with uplifted hands engaged in prayer, and the popular name, "Niña de la tierra," child of the earth, has been bestowed upon this insect.

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### A Bee Visitor of *Pontederia* (Pickerel-weed).

BY H. L. VIERECK.

Within the last five years I have received specimens of an interesting bee which seems to represent a new genus and species belonging to the Dufoureidæ and closely allied to *Halictoides* as represented by *H. marginatus* Cress. The first specimen that came to me was a male, taken at Darby, Delaware Co., Pa., August 10, 1899, by Mr. C. W. Johnson; the next specimen was a female, collected at Chestertown, Md., August 12, 1901, by Mr. E. G. Vanatta. Last year I received the first specimen with flower record from Mr. J. H. Lovell, who later sent me, in all, one female and ten males, taken on *Pontederia cardata* L., July 20, at Waldoboro, Me. I quote Mr. Lovell's interesting notes on the capture of these specimens. "On the afternoon of the 20th of July I was on the river in a boat. A thunder-shower was coming up in the northwest. The air

was very still and in that peculiar condition which precedes an electric storm. At such times insects are very sluggish and seek shelter against the approaching tempest. The silence was broken only by the rumbling peals of the distant thunder, following the bright flashes of lightning, which illumined the dark thunder-heads of the clouds. It became necessary for me to hasten homeward. To my surprise I noticed on almost every one of the violet-blue spikes of *Pontederia cordata*, or the pickerel-weed, which in countless numbers fringed the stream on both sides, one to several of these bees. They were so inactive that I could easily knock them off into the cyanide jar. I collected about forty specimens, and might have collected hundreds. This phenomenon has never been repeated to my knowledge."

The technical description is as follows :

**CONOHALICTOIDES** n. g.

The narrow head, the tuberculate posterior coxæ, and the structure of the palpi clearly separate this genus from *Halictoides*.

**Conohalictoides lovelli** n. sp.

♀. 6-7 mm. HEAD:—Distance between the anterior ocellus and anterior margin of clypeus at least one-half again as great as the distance between the eyes on a line with the antennal sockets; width of temple nearly equal to the width of the eye; front closely, finely punctured, sparsely on the eye margins; frontal impression very slight, a mere indication of a median line, which, just above the insertion of antennæ, is a short, shallow, narrow impression; ocelli arranged in a low triangle, distance between posterior ocelli about twice the distance between the lateral and anterior ocelli and about equal to distance between them and nearest eye margin; vertex with the punctures larger and sparser than on the front; cheeks rounded, punctured much like the front; clypeus with the anterior margin rounded, convex, polished, with large, distinct, separated, irregularly placed punctures; labrum with indistinct curved striæ, irregular near apex; mandibles with a distinct internal tooth about one-fourth the length of the mandible from the apex; antennæ short, not reaching back to the tegulæ, scape shining, second joint longer than third, the rest subequal, all joints of the antennæ, except the first, dull with very short pubescence; pubescence of head thin, loose and pale, whitish except on vertex and frons where it is black, abundant on the sides of the lower half of the face, margin of the clypeus with a fringe of long, straw-colored hairs; black.

**THORAX** :—Prothorax rounded, dull, finely sculptured, more shining and distinctly punctured on the narrow median portion; mesonotum finely sculptured, dullish, with a long depression on each side of the middle of anterior margin, punctures of two kinds present with and without hairs, the setigerous ones the larger; scutellum polished, with large, sparse punctures; postscutellum dull, indistinctly punctured on the sides; tegulæ polished, rounded behind, indistinctly punctured; metathorax with a flat semicircular disc longitudinally rugulose, sides dull, with sparse setigerous punctures, posterior face bearing sparse setigerous punctures and a median, dull, impressed space; scopa with plumose hairs on the superior margin—in between the hairs are simple, metatarsus of posterior leg one-half the width of the tibia, posterior coxæ produced, tuberculate, claws cleft, the inner tooth nearly as long as the apical tooth; wings—distance from the stigma to the first transverse cubitus on the radius equal to about three-fourths the distance from the first to the second transverse cubitus on the radius, distance between the first transverse cubitus and first recurrent nervure on the cubitus a little greater than the distance between the second recurrent nervure and the second transverse cubitus, transverse median nervure slightly basad of basal nervure; pubescence present on the thorax, except on the disc of the metathorax, thin and whitish, most abundant and thickest on the sides of the thorax; entirely black, including stigma and nervures, membrane blackish, posterior tibiæ inclining to brown.

**ABDOMEN** :—Black, with testaceous margins to the segments, second segment depressed nearly one-half, shining, finely sculptured, covered with long and short hairs.

Maxillary palpi six-jointed, the first joint a little shorter than the second, the second joint about three-fourths the length of the combined length of the four terminal short joints, which are subequal; labial palpi four-jointed, joint one nearly as long as  $2 + 3 + 4$ , 2 a little longer than  $3 + 4$ , which are subequal, a very distinct fringe of hairs on basal joint of labial palpi.

♂. 6.5–7 mm. Similar to the female, with the following exceptions: Frontal impression hidden by pubescence on the lower half; antennæ moniliform, reaching beyond the tegulæ, all joints dull sericeous, joint 3 especially hairy, the hairs very short, joint  $2 = 3$  in length,  $2 + 3$  shorter than 4, 4 and beyond subequal; metatarsus of posterior legs about two-thirds as wide as the tibia; distance between second recurrent nervure and second transverse cubitus a little greater than the distance between the first transverse cubitus and the first recurrent nervure; abdomen rather polished, second segment depressed one-third, margins pruinose.

Cotypes in Coll. Acad. Nat. Sci. Phila. Paratypes in Coll. U. S. N. M. and Boston Society of Nat. Hist.

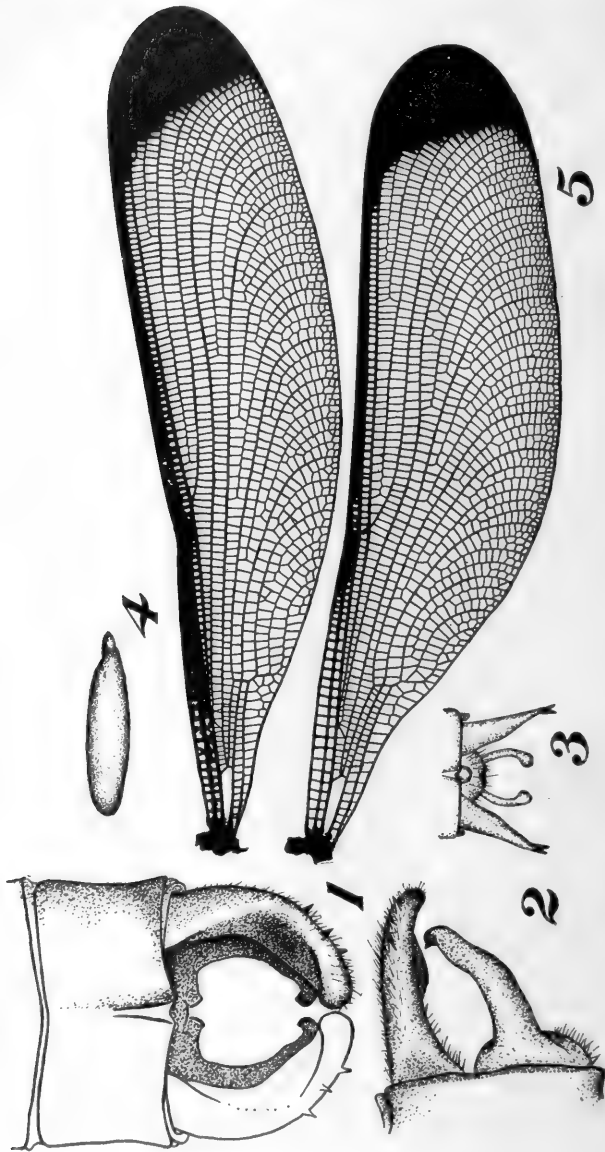
Type locality, Waldoboro, Me.

## A new Species of *Psolodesmus* (order Odonata) from Formosa.

BY E. B. WILLIAMSON.

Among some Odonates recently received from Rev. H. Loomis are specimens from Formosa of a large and beautiful species of *Psolodesmus*, of the subfamily Calopteryginæ, which seems to be new.

The genus *Psolodesmus* may be recognized as belonging to de Selys' Legion Calopteryx (exclusive of *Vestalis*) by the following characters: antenodals of the first and second series present, numerous, largely coinciding excepting possibly a few near the nodus;  $M_{1+2}$  rising abruptly upward from  $M_3$ ; wings scarcely or not at all petioled; subquadrangle straight, not bent at the level of the arculus; basal space about equal to or shorter than the quadrangle; and a posterior branch of  $Cu_2$  present. *Psolodesmus* is related to *Mnais* by the presence of a true stigma in both sexes; basal space free; arculus bent;  $M_{1+2}$  fused with the radius for a short distance; sectors not branched; posterior branch of  $Cu_2$  not directed basally. From *Mnais*, *Psolodesmus* is distinguished by the more retracted nodus (in *Mnais* the distance to the nodus from the wing base is more than two-fifths the wing length, in *Psolodesmus* less than two-fifths the wing length, and in *Psolodesmus* in the front wings  $M_2$  arises several cells beyond the subnodus, and not at the subnodus as in *Mnais*); by the more complex venation (secondary sectors and cross-veins more numerous in *Psolodesmus* than in *Mnais*); by the long and narrow quadrangle (in *Mnais* the quadrangle is scarcely as long as the basal space, in *Psolodesmus* it is about  $1\frac{1}{2}$  times as long, and with about twice as many cross-veins as in *Mnais*); by the medio-anal link (*i. e.*, the vein closing the distal end of the quadrangle and subquadrangle) of the hind wings at right angles to the long axis of the wing or with the anterior end slightly more basal than the posterior end (in *Mnais* the posterior end of the medio-anal link is decidedly more basal than the anterior end); and by the hind margin of the wings, especially the hind wings, behind the subquadrangle, decidedly more concave.



*Psolodesmus dorothea* n. sp.

- Figs. 1 and 2.—Abdominal appendages of ♂, dorsal and profile views.  
 Fig. 3.—Dorsal view of the appendages of ♀.  
 Fig. 4.—Egg; size  $\frac{1}{2}$  mm. in length.  
 Fig. 5.—Wings of ♂.



***Psolodesmus dorothea* n. sp.**

Total length ♂ 70-71, ♀ 60-61; abdomen ♂ 58-59, ♀ 48-50; hind wing ♂ 45-46, ♀ 43-45; width of front wing ♂ and ♀ 12; stigma front wing ♂ 2.5, ♀ 2; last femur ♂ and ♀ 8; tibia and tarsus to end of tarsal claws ♂ and ♀ 10; length of longest cilia on legs ♂ and ♀ 2 + mm.

Head black, postclypeus metallic green, second joint of the antennæ pale greenish on the anterior side, longer than the inconspicuous first joint, eyes brown. Thorax and abdomen slender; thorax metallic green, middorsal carina and lateral sutures very narrowly, sides below and prothorax, black; legs black, pale basally especially on the inferior surface, where the pale area extends about half the length of the femora; cilia numerous and long.

♂. Pectus black, a sharply defined pale spot near the posterior border. Wings hyaline with violet and green reflections, apices for a distance of 5 mm. and stigma dark brown, the colored wing membrane with more brilliant reflections than the hyaline portions of the wings, coppery being most conspicuous; inner edge of brown area more or less concave; the dark brown or black of the wing apices extends basally more or less definitely along the anterior portion of the wings in the costal, subcostal and radial spaces, more heavily marked in the front wings where the color may extend quite to the wing base, doubtless variable with age. Antenodals front wings 33-37, hind wings 32; postnodals front wings 79-81, hind wings 71-75.

♀. Pectus pale, abdomen dark brown basally, shading posteriorly into black. Wings similar to the male, but with the brown on apices more extensive, 7 to 8 mm. in length, and the brown of the anterior margin less sharply defined; inner edge of brown apices nearly straight; stigma chalky white. Abdominal appendages slender, acute, as seen from the side about as long as segment 10; the extreme apex bi- or trifurcate.

Habitat—Formosa; 3 males and 2 females in my collection, all mature. Dr. Calvert has examined a ♂ and a ♀ and confirms my opinion as to the distinctness of the species. Named for my mother, Dorothea Kellerman Williamson.

The single hitherto known species of *Psolodesmus*, *mandarinus* McLachlan, originally described from a single imperfect ♂ from Amoy (Trans. Ent. Soc. Lond., p. 166, 1870) and later recorded and described from two males from Formosa by Hagen (C. R. Soc. Ent. Belg., xxiii, p. 1xii, 1880), is at once distinguished from *dorothea* by the more extensive black on the wings (*mandarinus* has the apical fourth blackish brown) and the presence of a broad semi-opaque white band across the wings, no trace of which exists in *dorothea*. In coloration of wings *mandarinus* is described as somewhat suggest-

ing *Echo margarita*. *Dorothea* rather suggests the males of the species of *Calopteryx* of the *æquabilis* group, especially *dimidiata*, which species also were suggested to de Selys by *Vestalis apicalis*.

## A New Species of *Ecitopora*.

BY CHARLES T. BRUES.

This is the third species of *Ecitopora* to be discovered in the United States living, like the other species of the genus, in the nests of the blind legionary ants, *Eciton*. The species can be readily distinguished by the accompanying figures.

### *Ecitopora nitidiventris* sp. nov.

Length 2.25 mm. Pale fuscous. Head fuscous, with rather distinct sparse punctures. Thorax testaceous. Elytra testaceous, but appearing almost piceous in certain lights. Abdomen fuscous, lighter at apex and also at base, especially below. Legs pale testaceous. Antennæ thickened toward the tips; fuscous, paler at base; joints after the first, of about equal length, except the last, which is conical and a little longer than the two preceding joints; each of the latter one and three-fourths times as wide as long. Thorax slightly wider than long, narrowed slightly and broadly rounded behind; its lateral depressions deep and extending for its entire length; posteriorly there is a shallower median depression. Thorax and elytra sparsely golden pubescent. Abdomen bare, shining; each segment with a marginal row of about eight long hairs. Abdomen of equal width, rather suddenly obtusely acuminate at tip.

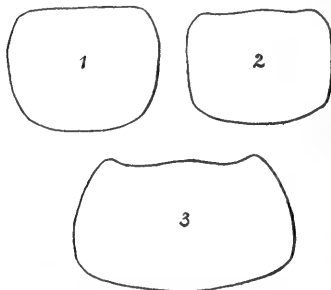


Fig. 1.—*Ecitopora nitidiventris* sp. nov.  
Outline of prothorax.  
Fig. 2.—*E. tenella* Wasm. Same.  
Fig. 3.—*E. laticollis*. Same.

Described from two specimens collected in a nest of *Eciton coecum* Latr., at Austin, Texas, during March, 1902.

*E. nitidiventris* is readily distinguished from *E. laticollis* Brues by the form of the thorax, and from *E. tenella* Wasm. by the bare, nonpubescent, shining abdomen, which has fewer marginal hairs upon the dorsal segments.

## A New *Colletes*.

By MYRON H. SWENK, Lincoln, Neb.

### *Colletes robustus* n. sp.

♀. Length 12-14 mm. General form stout. Dull black, almost bare. Head slightly narrower than thorax, extremities of orbits rounded. Clypeus somewhat shiny, almost bare, flat, coarsely striately punctured, transversely depressed before apex, a small median impunctate spot at extreme base and one in middle of supraclypeal area. Face on either side of clypeus finely and closely punctured, but changing abruptly to coarse close punctures above insertion of antennæ, its pubescence short and white, becoming dense in a ruff about base of antennæ. Antennæ unusually short and heavy, wholly dark, with under surface of flagellum lighter than upper, and its first joint longer than second. Vertex slightly depressed along sides, bare and shiny, with large, coarse, separated punctures and small ones between. Occiput with short, rather dense white pubescence and no obvious dark hairs. Cheeks finely punctured and sparsely provided with pale pubescence. Malar space scarcely defined, extremely short. Labrum with five deep depressions separated by four prominent sharp ridges, the median depression largest. Mandibles heavy, a small notch well removed from the rounded tip, medially and apically rufescent or wholly black.

Prothorax with short but conspicuous, stout, sharp spines. Mesothorax punctured much like clypeus, the coarse crowded punctures running into irregular striæ at places, only a very small subimpunctate spot on disk, the anterior half with a deep median depression. Disk practically devoid of pubescence, the few scattered hairs on it very short, pale and black intermixed; a dense tuft of short pure white hair on tubercles, and longer and sparser gray hairs surrounding tegulæ and passing as a narrow fringe around posterior border of scutellum. Scutellum shining, its coarse round punctures well separated anteriorly but crowded posteriorly, post-scutellum roughened by fine, close punctures and fringed posteriorly with long pale hairs. Metathorax without a superior face and no series of pits, the enclosure funnel-shaped, its bowl a little shiny, with the whole surface coarsely and irregularly plicate, the neck short and constricted at the base, which is not wider than the tip. Lateral faces of posterior truncation coarsely and weakly punctured on a dull very minutely punctured surface, exteriorly with a fringe of pale hairs. Mesopleura with coarse, crowded punctures forming striæ, on a small space immediately under tegulæ with finer separated punctures, very thinly clothed with pale hairs. Tegulæ piceous edged with testaceous, punctured. Wings slightly darkened hyaline, iridescent, very pubescent, nervures very dark brown to blackish, stigma brown.

Legs large, stout, black, more or less shining, especially on femora, the apical tarsal joints sometimes inclining to dull ferruginous, clothed

with short whitish pubescence, longer, dense and bristly on posterior femora and tibiæ, the inner apices of tarsal joints with rufous fringes. Claws ferruginous, tibial spurs paler ferruginous, the inner one with numerous minute but distinct pectinations. Abdomen dullish, the whole surface coarsely and closely punctured with punctures a little finer than those on mesothorax, the first segment somewhat striate punctate especially laterally, medially with a well defined ridge on posterior half, its apical margin depressed, with a very dense, white pubescent fascia concealing a smooth subttestaceous surface; second and following segments similarly punctured, apical margins of 2-4 similarly depressed, with similar fasciæ, 5 depressed but its fascia narrower and less dense, apex with pale pubescence. Other than the fasciæ the abdomen is but inconspicuously pubescent, all hairs pale. Venter similarly but much more finely punctured, with dense pale pubescence forming a scopa, pollen-bearing on three basal segments, no decided fasciæ.

♂. Length  $9\frac{1}{2}$ -13 mm. Similar to ♀ except as follows:—Thorax above with rather long and erect pubescence, densest on margins and tegulæ, longer on scutellum and sides of metathorax, all grayish white; occiput and cheeks with long white pubescence; clypeus covered with pale pubescence, punctured similarly to, but, except at apex, much finer than in ♀; antennæ long, flagellum varying from black to bright testaceous beneath, basal joint less than one-half as long as second; vertex crowded with coarse punctures; malar space better defined, but still very short; labrum with the deep median groove, but lateral ones subobsolete; mandibles often largely rufous, especially terminally; prothoracic spine less conspicuous; punctures on mesothorax more separated, a rather large, shining, impunctate space on disk; metathorax with a poorly defined superior face and an imperfect, irregular series of subrectangular pits, longer than broad and slightly shiny; legs more or less ferruginous, all the tarsi brightly so, that on tibiæ and femora of variable amount, generally dull; anterior femora with a long, dense, white beard; punctures on abdomen generally separate, not striate, median ridge on first segment obsolete, fasciæ on segments 1-6; venter often testaceous, no scopa.

Specimens examined.—Types: ♀, Neligh, Neb., August, 1899, at *Petalostemon* (M. Cary); ♂, Dundy Co., Neb., June (E. H. Jones). Cotypes: ♀, Las Vegas, N. M., at *Petalostemon candidus*, July 21 (T. D. A. Cockerell); do., at *Solidago canadensis*, August 11 (W. P. Cockerell); 15 ♂♂, Dundy Co., Neb., June (E. H. Jones); ♀, ♂, Morton Co., Kan., 3200 feet, June, 1902 (F. H. Snow); ♀, Hamilton Co., Kan., 3350 feet (F. H. Snow); ♂, Clark Co., Kan., 1962 feet. June (F. H. Snow). A bee of the semi-arid interior.

The ♀ of *robustus* may be distinguished from the other

described North American *Colletes* by its large size, lack of ochraceous or fulvous tinge on the dorsal pubescence, and dull closely and coarsely punctured abdomen. Its nearest ally seems to be *C. gilensis* Ckll., from which it differs in numerous respects, among them, Mr. Cockerell informs me, in its palpi. The ♂ of *robustus* is evidently quite close to *C. robertsonii* D. T. (= *punctata* Robt.), which is also a *Petalostemon* visitor, but the abdomen is not shining, nor the whole of the legs ferruginous.

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"ON JUNE 14th ——— wrote me an apology for not having returned me some insects as per promise, being very busy at the office and head over heels in work in the 'bug room,' and said, 'I am also breeding a few things, and they are hatching on me all the time.' I replied, expressing my sympathy, and told him I had experienced the same discomfort during the '60s down in 'Old Virginny,' and that I had found the best thing to do was to rub the seams of my clothes with blue ointment until I could get a chance to boil them."

A FEW miles below the city of Cincinnati, on the Ohio side, the hills rise abruptly to about 450 feet above the Ohio River and enclose the narrow valley of Elkhorn Creek. The slope of these hills is toward the south, and the valley is never exposed to the north winds. Its wild flowers surprise us with their blossoms in February and March, and all of its spring vegetation is nearly three weeks in advance of our season. There is not a sunny day in winter that does not warm up the slopes enough to call forth the grasshoppers and flies.

This place is of very great interest to the entomologist, for it produces species reported thus far only from the far south. The praying Mantis, *Phasmomantis carolina*, is found here in abundance. On June 7th of this year I took a fine pair of *Polygrammodes hirtalis* Gn., heretofore reported from Texas and Mexico. I have also taken here *Sciagraphia punctolinata* Pack., *Goniacidalia furciferata* Pack., and *Tricolaphe nonstrigella* Cham., and a number of species of Tortricids and Tineans not in the collections of eastern specialists and unknown to them. Many of the species collected here are found nowhere else around the city, and it appears from each collecting trip that there will be no end of surprises. I know a number of these species breed here, and it is difficult to suppose that any of the others fly from farther south across a river that is more than 1000 feet wide at this point. The spot, like an oasis in a desert, has a fauna all its own, probably an enduring one, for its inaccessible nature renders it of no interest except to the enthusiastic botanist and entomologist.—ANNETTE F. BRAUN, Cincinnati, Ohio.

# ENTOMOLOGICAL NEWS.

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**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

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PHILADELPHIA, PA., SEPTEMBER, 1904.

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The entomological world appears to be having an acute spasm over the nomenclature question. This is a chronic complaint with occasional exacerbations. Human beings are agreed as to mighty few things, and the only way we see to settle this vexed question is by an authoritative congress or court of last resort. At the present time it is difficult to find two persons who have exactly the same ideas on this important subject. As we said in the beginning, there are conflicting opinions about almost everything, religion, politics and lesser things, and we do not see why the question of nomenclature should be much of an exception. It is annoying, to be sure, but there is much to be done in entomology irrespective of this. If the collector is restive under the battle of the synonyms, let him take up some problem, such as a life history, and work it out to a conclusion for the benefit of knowledge. It will be good work, and which "mihi itch" genus the thing is placed in is of lesser moment.

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**CURATOR APPOINTED.**—C. Abbott Davis, the well-known entomologist and former instructor in the Technical High School, has been appointed curator at the Park Museum, Providence, Rhode Island, to fill the vacancy caused by the death of James M. Southwick.

**PROF. V. L. KELLOGG**, of Stanford University, will spend the coming academic year on leave of absence in Europe. Personal letters will be forwarded. Requests for reprints of papers or for specimens, etc., should be addressed, to avoid delay, to the Department of Entomology, Stanford University, California.

## Entomological Literature.

RECENT LITERATURE.—Our knowledge of the muscle development of the Coleoptera has received a valuable addition in a recent paper ("The Changes which occur in the Muscles of a Beetle, *Thymalus marginicollis* Chev., during Metamorphosis," Bull. Mus. Comp. Zool. Harvard, xl, pp. 317-380, Pls. 7) by R. S. Breed of Harvard University, in which he gives a very minute account of the anatomical and histological changes which occur in the individual muscles of a beetle during metamorphosis. As the metathorax proved to be the most suitable segment for study, its muscles received the most careful examination. Some twenty-five muscles in this region are enumerated and the changes of each considered separately, as it was found that all do not undergo a similar metamorphosis. Of this number not a single one persists unaltered from the larva; the greater proportion undergo a metamorphosis, while a number of the larval muscles degenerate. Only two of the imaginal metathoracic muscles are of entirely new formation in the pupa. The only region of the body in which any of the muscles were found to persist unaltered from larva to adult is in the abdomen. This is to be expected, as the abdomen shows the least amount of external change during metamorphosis and contrasts with the thorax where a great amount of external remodeling is correlated with a radical change in the musculature. In the legs all of the imaginal muscles appear to be formed by a metamorphosis of the larval ones. The trend of recent opinion with regard to phagocytosis in the Coleoptera is upheld, as no evidences of this phenomenon were observed in any of the muscles of *Thymalus*, all degeneration changes being apparently of a chemical nature. The author believes that in Coleoptera the cells that have been described as phagocytes are in reality tracheal cells developed from the tracheoles of larval muscles.

C. T. B.

PROF. AND MRS. T. D. A. COCKERELL spent the summer in Europe. This month they go to the University of Colorado, at Boulder, to teach biology. Prof. Cockerell will have a research laboratory in the University.

PLEASE take notice that after June 15th my address for packages as well as usual mail will be: C. F. Baker, Estacion Agronomica, Santiago de las Vegas, near Habana, Cuba.

A VERY good substitute for cork for micro double mounts is to take a piece of soft felt, dampen it, and put a good quantity of photopaste on both sides, cover with white paper, press well, and dry. Then cut long, narrow strips with paper-cutter (any printer will do this for you if you haven't a cutter), and straighten the strips. When you are convinced the felt is thoroughly dry, cut your strips in desired lengths for pins. The strips can be cut very slender, are neat and also economical, as any old soft felt hat can be used for the purpose. In pushing your label pin through, give support to the felt, and with minutien pins use your pliers. Mrs. F. Weigand of Philadelphia suggested the idea, and it is practical.—H. HORNIG.

## Doings of Societies.

A regular meeting of the Entomological Section of the Chicago Academy of Sciences was held May 19th, at the John Crerar Library, Eight members and three visitors present. Mr. Frank E. Lutz, of the University of Chicago, gave a talk on the Economic Importance of Mosquitoes and a brief sketch of a four years' attempt at their extermination on Long Island, New York. Mr. Weed, formerly of the Mississippi Agricultural Experiment Station, added some experiences of his own, and the subject was further discussed by the members. The field day on May 30th was held at Millers, Indiana.

A. KWIAT, *Recorder.*

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At the meeting of the Feldman Collecting Social held May 18th, at the residence of Mr. H. W. Wenzel, 1523 S. 13th St., Phila., ten persons were present.

Mr. H. W. Wenzel announced the death of Father Jerome Schmitt of St. Vincent's Abbey.

Dr. Skinner exhibited two new species of *Epicauta*, which will be described in ENTOMOLOGICAL NEWS.

Mr. Wenzel showed a number of blind Carabids from caves in Austria.

Dr. Skinner spoke of a recent trip with Messrs. Kearfott and Daecke to the Orange Mountains, in the vicinity of Montclair, N. J., after *Pyrgus centaureæ*. He said that the species is very local, occurring only in hilly regions, and spoke of the value of a study of these extremely local distributions.

Discussed by Messrs. Franck, Daecke, Wenzel and Skinner, Mr. Franck referring especially to *Lycæna scudderi*.

Mr. Daecke showed *Cnorimoschema gallæsolidaginis* raised from galls; also *Culex cantator*, which was very abundant recently at Richmond Hill, Long Island.

WILLIAM J. FOX, *Secretary.*

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EDITH M. PATCH, entomologist to the Maine Agricultural Experiment Station, at Orono, Me., is the first woman to occupy such a position in the United States. All women are not afraid of bugs and mice. We wish the lady great success.



# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

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## Four New Spiders from Kansas.

By THEO. H. SCHEFFER, A. M.

(Plate XVII.)

The four new species of spiders herein considered were first described in "A Preliminary List of Kansas Spiders," published by a local journal of the Kansas State Agricultural College, April 2, 1904. It has seemed desirable to give the descriptions more general publication, especially since a few errors crept into the original article. Types of the species form part of the collection of the Kansas State Agricultural College, and duplicates have been sent to the National Museum at Washington.

### Family THOMISIDÆ.

#### ***Xysticus modestus*** sp. nov. (Fig. 1.)

This is a modest little crab spider, smaller than any of the species ordinarily considered as common.

Female.—Length 4.5 mm. ; width of cephalothorax 2 mm. ; width of abdomen 3 mm. First and second pairs of legs stout, the tibiae and metatarsi armed with two rows of spines set along the anterior margin. The corresponding joints in the legs of the third and fourth pairs show a few weak spines on the under surface.

The middle area of the cephalothorax is yellow, brightest near the base. In the central longitudinal line is a narrowing streak of brown running back from a point between the posterior median eyes. On either side of this streak is a broader stripe of brown, ending a short distance in front of the posterior margin, in an enlarged portion curved slightly outward. Still farther out, conforming to the outward curve of the cephalothorax, is a broad stripe of brown bordered laterally by a narrow line of yellow. On the extreme lateral margin is a hair-line of brown.

The ground color of the abdomen is dark brown. There is a narrow central stripe of dirty yellow and three broad transverse bands of about the same color. The portion of the dorsal region not occupied by these bands is punctate with yellow. The legs are yellowish brown, the former color predominating in the proximal joints, the latter on the tibiæ, metatarsi and tarsi. The third and fourth pairs of legs are lighter in general than the first and second pairs. Scattered over the abdomen and also on the front of the head and on the pedipalps are numerous stubby hairs, some of them enlarged at the ends so as to be almost clavate.

This spider is a pronounced type, but not common. Several females were taken under stones near Manhattan in June. In this situation they were guarding their egg sacks.

#### Family SALTICIDÆ.

##### *Phidippus ferrugineus* sp. nov. (Figs. 2, 3.)

This is a large species with two dominant colors—black and reddish brown.

Female.—Length 14-15 mm. Length of abdomen 10 mm.; width of abdomen 7 mm.; height of abdomen 6 mm. Width of cephalothorax 4 mm.; height of cephalothorax 4 mm.

Legs.—Relative length 4, 1, 2, 3. Absolute length 9.5, 9, 8.5, 10.5 mm., respectively.

Colors.—The abdomen is black beneath and on the sides, with sometimes faint indications of lighter spots or streaks. Above it is reddish brown, except in the central longitudinal region, which is occupied by a black stripe extending from the anterior pair of muscle depressions to the spinnerets. This stripe broadens just back of the posterior muscle depressions until it is nearly 3 mm. in width, when it narrows again gradually toward the tip of the abdomen. In some specimens the red projects into the stripe so as to form two pairs of spots. Often these spots are entirely isolated from the red of the dorsum. Occasionally a spider has scarcely any indication of the stripe, being of a uniform reddish brown color above. Usually a lighter red or yellowish streak extends along the front border of the abdomen and runs diagonally down the sides. Back of the diagonal portion of this stripe may be one or two more yellowish stripes running down from the red-brown of the dorsum.

The cephalothorax is black beneath, on the sides, and on that portion of the dorsal aspect that slopes toward the abdomen. The higher portion is reddish brown above, like the abdomen. The chelicerae are iridescent green and purplish. The pedipalps and the first two pairs of legs have yellowish scales scattered here and there, and rings of like color near some of the joints. The presence of some long whitish hairs on these appendages is also common. The second and third pairs of legs are almost always uniformly black, though some specimens have the proximal half of the tarsus lighter.

This spider spends the winter under loose stones in large oval dwelling-sacks of closely woven silk, protected in some cases by the addition of leaves or trash. I have found the species only in the vicinity of Manhattan, on the summits or higher slopes of hills capped with the Permian limestone. I have not been able to identify the male.

#### Family ARGIOPIDÆ.

***Araneus singæformis*** sp. nov. (Figs. 4, 5, 6.)

This small orbweaver is of the type usually referred to the genus *Singa*, a group whose species Simon includes in the genus *Araneus*.

Female.—Length 4-5 mm. The abdomen is oval, moderately high, and symmetrical in outline. It projects some distance over the cephalothorax. The latter is broad back of the head region, which is much narrower and distinctly set off by lateral grooves. The head itself is considerably elevated. The median ocular area is nearly or quite square. The lateral eyes are contiguous. The legs are short and show very few spines.

Coloration.—The cephalothorax, legs and chelicerae are various shades of dull yellow. The head is usually brightest and the thoracic region darkest, in some cases tinged with brown. The legs are unmarked, except in an occasional specimen which shows traces of longitudinal stripes, particularly on the femora. The ocular quadrangle, as well as a small area about the lateral eyes, is black. The abdomen above and on the sides is whitish, tinged with a fine network of brown. The muscle depressions are marked by brownish spots, and down the center of the abdomen in most specimens is a more or less branched scar-like stripe. A broad border of black nearly or quite encircles the dorsum near the margin. Sometimes it is interrupted at the anterior end and occasionally also at the posterior end. The central portion of the abdomen beneath is occupied by a broad black band running back from the epigynum and enclosing the spinnerets. On either side of this is a narrow stripe of

white, and between this stripe and the margin another band of black. The sternum is also black. These black areas, above and below, are more or less dotted over with light spots.

I have taken but one specimen of this spider in sweeping, but secured over a hundred mature females from the provision stores of mud-dauber wasps in Wallace County, July 16th.

#### Family LYCOSIDÆ.

##### *Lycosa wacondana* sp. nov. (Fig. 7.)

A small species, found about springs or creeks on the prairies.

Female.—Length 7-8 mm. ; width of cephalothorax 3 mm. The abdomen is slightly longer than the cephalothorax, which is narrow in front and widens rapidly back of the head, the thoracic region proper being as broad as it is long. The posterior margin of the cephalothorax is very noticeably procurved above the peduncle.

The legs are rather long and slender. The fourth pair is longest, measuring about 13 mm. The front pair measures 10 mm. They are sparsely covered with dark hairs and beset with black spines.

The ground color of the legs is dull yellow, but they are darker toward the ends, and some of the joints, particularly the femora, are banded near the middle and at their extremities by the darker shade. The coxæ are lighter above and below than the general ground color of the legs. At the proximal end of the trochanters, anteriorly, is a slight roughened prominence or two much darker in color. The brownish cephalothorax presents a dull yellow middle stripe, widest back of the eyes, and two somewhat undulating lateral stripes of the same color. The dorsal groove is marked by a fine dark line. From its anterior end a forked stripe of brown runs forward to the eyes. In the brown area between the central and lateral stripes of the cephalothorax are several darker streaks arranged radially from the dorsal groove. The ground color of the abdomen is a darker brown than that of the cephalothorax. It is finely punctate with dull yellow. On the front half is a pointed yellow stripe running back to the region of the muscle depressions, and there are faint indications of transverse streaks on the hinder half. The sternum is light in the middle and darker around the edges. The under side of the abdomen is similarly colored, except that in the central line of the lighter area is a darker streak running from the epigynum to the spinnerets.

I do not know the male of this species. Have taken the female in June about Manhattan, and in August at Waconda Springs. On the latter occasion nearly all the females were carrying cocoons of eggs.

## EXPLANATION OF PLATE XVII.

- Fig. 1.—*Xysticus modestus*, dorsal view of female.  
 “ 2.—*Phidippus ferrugineus*, dorsal view of female.  
 “ 3.— “ “ side view.  
 “ 4.—*Araneus singæformis*, dorsal view of female.  
 “ 5.— “ “ ventral view.  
 “ 6.— “ “ epigdnium.  
 “ 7.—*Lycosa wacondana*, dorsal view of female.

## The American Genera of the Bee Family Dufoureaidae.

BY HENRY L. VIERECK.

As defined by Robertson, Can. Ent. xxxvi., p. 37, this family constitutes a compact group of genera in the old Panurgidæ.

Labial palpi with the first joint distinctly longer than the next three, second joint at least one-third as long as the first joint; posterior femora in the male laminate; abdomen not toothed.

**Neohalictoides** n. g., type **N. (H.) maurus** Cress.

Labial palpi with the first joint distinctly shorter than the other three, second joint about three-fourths the length of the first joint.

Legs ordinary . . . . . **Ephalictoides** Ckll.

Legs elaborately produced into spines and angles.

**Cryptohalictoides** n. g., type **C. spiniferus** n. sp.

Labial palpi with the first joint rather shorter than the next three joints together, the second joint about one-half the length of the first joint . . . . . **Parahalictoides** Ckll.

Labial palpi with the first joint about one mm. shorter than the next three joints together, the second joint about two-thirds the length of the first joint or a little shorter; head narrow, distinctly longer than broad; male with a pointed tubercle on the posterior trochanters . . **Conohalictoides** n. g., type **C. lovelli** Vier.

**Cryptohalictoides spiniferus** n. g. n. sp.

♂. 11 mm. long. Head.—Front closely and finely punctured, frontal impression represented by a faint impressed line, above the insertion of each antenna is an oval impression; vertex with the punctures larger than on the front and scattered, closest back of the ocelli; cheeks if anything a little broader than the eye, punctured like the front; distance between posterior ocelli a little less than the distance between the lateral ocellus and the nearest eye margin; clypeus closely punctured nearly hidden by the hairs hanging over it, apparently smaller than the labrum; labrum convex, smooth, somewhat longitudinally striated, punctured on the lower margin; mandibles with a short blunt tooth not far from the apex; scape about as long as the second joint of the flagellum, pedicellum distinctly shorter than joint one of the flagellum, the pedicellum and the first joint of the flagellum together shorter than the second joint of the

flagellum; pubescence of the head pale whitish, thin and loose, most abundant below the antennæ, where it almost obscures the surface; head black, mandibles brownish, flagellum, except the first joint brownish beneath.

*Thorax*.—Prothorax rounded, presenting a transverse fold, dull, rugulose; dorsulum shining and with distinct punctures well separated on the posterior half, the anterior half dull with the punctures almost adjoining; scutellum sculptured like the posterior half of the dorsulum, with a slight median groove; postscutellum rugulose; metathorax with its superior face scooped out and striated the striæ rather close together and regular, the central one strongest, posterior face with an indistinct sulcus, the surface rugulose as is the surface of the metapleura; legs with the following peculiarities, anterior tibiæ swollen, produced into an angle on the anterior margin, this angle is notched and has a beak on one side of the emargination, beyond the angle is a finger-nail-like production which shuts down on the apical tubercle of the inner side of the metatarsus; metatarsus at base with a blunt production, the other tarsal joints of the anterior legs not produced, claws cleft; medial legs with the femora produced into a large triangular process posteriorly, that is as long as the femur, tibiæ almost triangular in outline, the production on the anterior margin emarginate so as to give the appearance of a truncate process on the anterior margin; metatarsus broadly produced near the base, flattened and laminate posteriorly on the apical half, apex anteriorly produced into a blunt process the other tarsal joints as on the anterior legs; posterior legs with the femora produced posteriorly and drawn out into a slender styloid process rounded at the tip and directed backward and inward, tibiæ broadly produced the production directed inward and provided with two strong processes, the anterior process like a claw and directed forward and outward, the tip directed backward and outward, the posterior process is broad and blunt, almost truncated and directed downward and slightly outward, metatarsus somewhat flattened broad and angulate on the posterior margin, first joint of the small tarsal joints about as long as the next two together, the terminal joints as in the middle and anterior legs; wings brownish, nervures very dark brown, stigma nearly black, first recurrent nervure nearly interstitial with the first transverse cubitus. Abdomen shining, rather coarsely tessellate, the broad margins brownish, distinctly depressed and minutely punctured, fifth ventral segment with a triangular space sharply outlined, terminal dorsal segment with a narrow median impunctate space, at the apex of the abdomen the pubescence is nearly as abundant as on the face below the antennæ. The metathorax and abdomen are less pubescent than the rest of the body, first three dorsal segments with white pubescence; the fourth, fifth and sixth with black pubescence. Black, legs partly inclining to brownish, apical two or three tarsal joints and claws brown.

*Type locality*, Nevada. *Type*, Am. Ent. Soc., Phila.

## Notes on the Orthoptera of the Keweenaw Bay Region of Baraga County, Michigan.

BY JAMES A. G. REHN.

(Continued from p. 237, Vol. xv, No. 7.)

### ***Dissosteira carolina*** (Linnæus).

Twelve specimens; four males, eight females. Pequaming, August 8, 11, 20, 21, 22, 25 and 31. Road along lake shore, August 20. Brulé on mainland opposite Pequaquawaming Point, July 31.

“The first specimens of this species were seen on July 18th. They did not become very common till the end of the month, and were restricted to colonies along dry, dusty roads. In September, when all other grasshoppers were very much thinned out, this species had not diminished in numbers.”

### ***Circotettix verruculatus*** (Kirby).

Twenty-five specimens; fourteen males, eleven females. Pequaming, July 18 (shore, edge of tamarack swamp), 22, 27, 31; August 2, 21 and 31, L'Anse, July 23. Point Abbaye, July 31. Shore of Keweenaw Bay, L'Anse et Vieux Desert Reservation, July 22.

“This species first appeared on July 16th; they increased rapidly in numbers and were quite common until almost the end of August, about the town, in the lumber-yard and among driftwood on the shore. By September 1st they had become very scarce, and the few specimens I took were in bad condition. Their flight is very strong, and they spring off with such swiftness that they are difficult to catch even with a net. They are very shy, but can be approached from the rear to within striking distance, if sufficient care is used. They fly high when alarmed, sometimes going far above the treetops, and I have seen one, when thoroughly frightened, fly swiftly out over the lake until lost to view. They start up with a sharp crackling; when frightened, however, usually flying silently; but they delight in hovering ten or fifteen feet above the ground, making, meanwhile a great clatter, which may be heard many yards away. This noise is kept up while ascending and descending, and is usually given two “crackles” at a time.”

**Podisma glacialis canadensis** E. M. Walker.

Six specimens; two males, four females. L'Anse et Vieux Desert Reservation, August 20, 31; September 4 and 5 (swamp, in thicket, on hazel bush).

"While beating some bushes in a ditch, on August 31st, I took two specimens of this species; returning to the same place the following week, I succeeded, with some difficulty, in taking a few more. They seemed to be in this locality only, and were there restricted to certain bushes. Besides those I took from the ditch, I took one specimen from a clump of raspberry vines; all the rest were beaten from clumps of hazel bushes, which are scattered through the high pastures. I beat each bush heavily, and in this way probably took a good share of the specimens stirring so late in the season. I took but one specimen without the net; this was a large female which I espied sunning itself on one of the topmost leaves of a hazel bush. It clasped itself tightly to the leaf, with the hind legs drawn down closely to the body and the antennæ held motionless. In this posture it was so well protected that I would never have seen it had I not picked a *Melanoplus* off a neighboring leaf, and, in so doing, almost touched it, causing it to move slightly. I took it in my hand, but hardly any effort was made to escape, and it clung firmly to my finger, and when touched shrank sideways in a peculiar manner. Owing to the fact that I did not beat the bushes in this vicinity before August 31st, it seems probable that *Podisma* had been there in perhaps greater numbers than I found it, for all other forms of Orthoptera appeared long before this date.

"Coloration of ♂.—All the colors and markings were very bright; deep emerald green appearing almost translucent, back purplish brown with a median chain of cream-colored marks.

"The males are active jumpers, easily springing from one part of the bush to another. They were quickly on the alert, but trusting to their very protective coloration they would not jump till almost touched by the net.

"General color of ♀.—Clear dull grass green, the exact shade of the cloth of a billiard table."



These specimens agree very well with three representatives of this race from North Bay and North River, Ontario, received from Mr. Walker. They are quite distinct from *P. g. variegata*, which is readily separated by the characters given by Walker. It is, of course, of rather questionable importance to name a form like *canadensis*, which is a logical intermediate between the two extremes of the species, but in view of the distinct geographic ranges of the three races, as at present understood, it is probably the most convenient.

**Melanoplus islandicus** Blatchley.

Five females. Pequaming, July 16 (hemlock woods); August 21 and 28. Baraga Co., August 30 (woods).

“Very scarce. Specimens taken in damp woods among dead leaves, marsh grasses and ferns.”

These specimens agree very well with a female individual from De Grassi Point, Ontario.

**Melanoplus huroni** Blatchley.

Three specimens; two males, one female. Pequaming, July 2 and 4. Foot of Point Abbaye, July 24 (huckleberry barrens).

Blatchley found this species in wild red raspberry tangles on La Salle Island, Lake Huron, Michigan.

**Melanoplus extremus** (Walker).

Seven specimens; two males, five females. Pequaming, July 2, 4 and 9; August 18.

“Very scarce. A few specimens taken in early July. They were all taken in the same clearing where I took so many *Mecostethus* in August, but with the other *Melanopli* they were all captured in the higher part of the clearing where the grass was short. They were, of course, unable to fly and seemed very poor at jumping.”

One male belongs to the long-winged form (*scandens* Scudder) and the remainder to the short-winged type. This single specimen is the only one taken as late as August 18.

**Melanoplus fasciatus** (Walker).

One male. Pequaming, July 18.

This specimen belongs to the long-winged form (*volaticus* Scudder).

**Melanoplus femur-rubrum** (De Geer).

Thirty-eight specimens; fifteen males, twenty-three females. Pequaming, July 5, 6, 10, 18, 22, 31; August 12, 16, 21, 25, and 31 (woods, meadow). Baraga Co., July 10, August 2 (meadow).

**Melanoplus atlantis** (Riley).

Seventeen specimens; seven males, ten females. Pequaming, July 10, 31; August 1, 5, 6, 8, 20, 21 and 31; September 6 (meadow). Baraga Co., July 22 (barrens near marsh), August 20 (road along lake shore).

"This species closely resembles *M. femur-rubrum* in almost every respect. They were to be found all of the time I was in Pequaming this season (from July 1st to September 8th), being most plentiful toward the end of July. This species was very abundant among driftwood along the lake shore at the edge of the marsh; in midsummer they were there by the hundred. I noticed that, when alarmed, they frequently sprang or flew out over the lake, where, falling in, they quickly propelled themselves to shore."

**Melanoplus luridus** (Dodge).

Nine specimens; one male, eight females. Pequaming, July 18 (shore), 22; August 16 (meadow), September 3. Brulé on mainland opposite Pequaquawaming Point, along shore of Keeweenaw Bay, July 22.

These specimens are much darker than individuals from De Grassi Point, Ontario, but otherwise identical. I have followed Blatchley (Orth. of Ind., p. 325) in considering *luridus* and *collinus* as the same species. The evidence given is so strong that there is no alternative.

**Melanoplus femoratus** (Burmeister).

Forty-seven specimens; twenty-two males, twenty-three females, two nymphs. Pequaming, July 9, 11 (meadow), 12, 18 (edge of tamarack swamp, on shore), 20 (meadow), 23 (meadow), 25 (meadow), 26 (woods on shore, road along

lake shore, woods near marsh), 27, 31; August 1, 5, 6, 9, 9, 16 (meadow), 21 and 31.

"This species did not appear till about the middle of July. They were to be found most plentifully in fields of tall grass, but in one spot among the driftwood at the foot of "The Point" I found a colony, restricted to a small area but containing many specimens. The males fly well, jumping up with alacrity, but never fly more than fifteen to twenty feet; the females also fly, but are very clumsy."

These specimens have the posterior tibiae uniformly blood red, varying slightly in intensity, thus placing them in *femoratus*. The form of the cerci is also that figured by Scudder as typical *femoratus*. Personally I believe *femoratus* and *bivittatus* to be geographic forms of the same species, very closely related, but still typical of each other over large areas.

#### TETTIGONIDÆ.

##### **Scudderia pistillata** Brunner.

Thirty-five specimens; twenty-seven males, seven females. Pequaming, August 20 (road along lake), 21 (meadow), 31; September 5 and 6. Baraga Co., August 21 (meadow), 30 (woods); September 5 (on hazel).

"I heard the first Katydid about the 12th of August, and as this is the only large Locustid found in this region I knew what species was producing the sound; before this date there was no insect which made a loud noise at night, now in the evenings "zikk-zikk-zikk-zikk" "zikk-zikk-zikk-zikk" could often be heard. A week later they were plentiful, and in the meadows and pastures their daytime note of "zzikk" was to be heard on all sides. In spite of the cold weather before I left, I found them as plentiful as ever on the last day on which I collected, and on the very cold days before that they were stirring, and several specimens were taken. Having found that they preferred the tops of bushes, where they could sun themselves, eat and stridulate, I found them easy to capture, for approaching slowly and cautiously, one could usually get within a few feet of the musician before it took alarm and ceased its music. I took numbers while beating the bushes

for *Podisma* and other insects. I captured a few specimens of *Scudderia* in the grass on July 3d, when they were smaller than a Tettigid."

**Xiphidion fasciatum** (De Geer).

Eighty-nine specimens; forty-four males, forty-five females. Pequaming, July 21, 22; August 1 (meadow), 5 (swamp, meadow), 9, 12 (meadow), 14, 15, 21, 25 and 31; September 2, 5 and 6. Baraga Co., August 21 (meadow and swamp).

"First mature specimens seen on August 1st. After this date they were very plentiful in all marshy places where there was tall grass, excepting in the great marsh—there, for some reason, none were to be found. The note produced by the males is high pitched but pleasing; it was very faint, and could be heard only as a continuous undertone in Nature's great fall orchestra."

Several specimens possessed wings and tegmina of unusual length when compared with the commoner type.

**Ceuthophilus terrestris** Scudder.

Ten specimens; eight males, two females. L'Anse et Vieux Desert Reservation, July 15, 26, 27; August 19, 31.

"On the 15th of July, under the stones about the Indian war-dance ground, I took nineteen specimens of this species, most of which were full grown. They were good jumpers, but the majority relied on their protective coloration, and remained motionless when the stone under which they were was turned over. They were to be found only under the large flat stones over the graves, which are noticeable now only by slight depressions about the war-dance circle. Their color was clear shiny brown, which blended perfectly with their surroundings."

GRYLLIDÆ.

**Nemobius fasciatus** (De Geer).

Sixty-seven specimens; thirty males, thirty-seven females. Pequaming, July 18, 31; August 1 (swamp), 5 (swamp), 6, 8 (meadow), 9 (swamp), 12 (meadow), 16 (meadow), 29 and 31; September 6. Brulé on mainland opposite Pequaquawaming Point, July 22. Baraga Co., August 30 (woods).

"Common almost everywhere except in the woods. After August 1st the mature specimens were most plentiful, especially in meadows and damp places, and their "creeeeeeeeeeeee" or "creee-creee-creee-creee" could be heard on every side."

Of the above-mentioned series but four specimens, two males and two females, belong to the long-winged type. As is usual in this species, a great amount of color variation is noticed in the individuals examined.

***Gryllus pennsylvanicus*** Burmeister.

Fifty-six specimens; thirty-five males, twenty-one females, one nymph. Pequaming, July 3, 18, 22, 28 (in decayed animal), 28 and 31; August 4, 12 (meadow), 14 (meadow), 21, 29, 30 and 31; September 5. Baraga Co., August 22, September 1 (meadow).

"This species was common under stones in fields and pastures. I found them particularly common under the stones scattered over the lumber mill sawdust pile. There were usually one male and one or two females under each suitable stone, but under one large stone I discovered four males and as many females. Their high, shrill chirping was constant, and could be heard at quite a distance from the sawdust pile. I have found the snake *Storeria occipitomaculata* under the same stone with a pair of these crickets. One day I came upon two males waging war under the edge of a stone. They were facing each other and, with wing covers half raised, one kept up a continuous whirring sound, sometimes rising in volume to a chirp. The other responded with a succession of faint chirps. They continued to edge around each other for several minutes, but I was obliged to leave and was unable to witness the outcome of the struggle."

The males in this series have the tegmina, almost without exception, solid blackish; while the females present all types from a blackish tegmen with a slight brown humeral vitta, to those with the whole organ considerably suffused with dull ochraceous. The latter type of coloration will be seen to approach *luctuosus*, but the smaller size and shorter ovipositor separate it from that form.

## List of the Tabanidae (Horse-flies) of North Carolina.

By C. S. BRIMLEY and FRANKLIN SHERMAN, JR.,  
Raleigh, N. C.

The present list is based upon collections made by the authors, for the most part in the last two years. The determinations have been made by Prof. James S. Hine, of Ohio University, to whom the authors are greatly indebted for this aid. The two species *Chrysops brimleyi* and *C. fulvistigma* were described by Prof. Hine in *Canadian Entomologist*, February 1904, vol. xxxvi, p. 55, from specimens sent him by the senior author.

As both the authors live at Raleigh, this locality has been more thoroughly worked than any other, but to a greater or less degree collecting has been done in this family in various localities from the seashore to an altitude of 4000 feet in the western part of the State. The credit for the very complete Raleigh records and notes on the comparative abundance of the species is due mainly to the senior author, whose work is confined principally to this locality, while most of the records for other localities is due to the junior author, whose duties give opportunity for work in various other localities.

All the species listed, with the exception of *Tabanus allynii*, have been actually taken by us, and that species is included on the positive record that it is known to occur in this State (*Can. Ent.*, vol. xv, 1883, p. 110). Indeed, North Carolina is the type locality for this species.

Except when otherwise stated, specimens are in the collection of the senior author, or of the N. C. Department of Agriculture, in charge of the junior author.

In nomenclature we have adopted the generic sequence usually recognized, but under the genera the species are arranged alphabetically.

The letters in parentheses immediately following the name of a locality denote its general position in the State; thus, the position of Raleigh, which is near the eastern border of the central portion of the State, is denoted by (E. C.).

1. **Chrysops brimleyi** Hine.

This species is described as new by Prof. James S. Hine in Can. Ent. for Feb. 1904, vol. xxxvi, p. 55, from specimens sent him by Mr. Brimley, for whom it is named. Specimens in collection of Prof. Hine.

*Raleigh* (E. C.). Late April and early May 1903; common,—a number taken; also taken in 1902; C. S. Brimley.

2. **Chrysops callidus** Osten Sacken.

*Raleigh* (E. C.). Abundant in its season. May 7 to July 17, 1902; C. S. Brimley. May 24, 1902; F. Sherman.

3. **Chrysops celer** Osten Sacken.

*Raleigh* (E. C.). Not common. May 7, 1902; May 13, 1903; C. S. Brimley.

5. **Chrysops flavidus** Wied.

*Raleigh* (E. C.). Abundant. May 20 to July 17, 1902; C. S. Brimley.

*Beaufort* (E.-coast). June 1, 20, 1903; F. Sherman.

5. **Chrysops fugax** Osten Sacken.

Only the one record. Specimens in collection of Prof. Hine.

*Raleigh* (E. C.). May 15, 1903; C. S. Brimley.

6. **Chrysops fulvistigma** Hine.

This species is described as new by Prof. James S. Hine in Can. Ent. for Feb. 1904, vol. xxxvi, p. 55, from two females sent by Mr. Brimley. No others taken. Specimens in collection of Prof. Hine.

*Raleigh* (E. C.). July 17, 1902; July 15, 1903; C. S. Brimley.

7. **Chrysops lugens** Wied. (= **C. morosus**).

*Raleigh* (E. C.). Common. May 20 to July 17, 1902; C. S. Brimley. July 2, 1903; F. Sherman.

*Blowing Rock* (W. 4000 feet.) June 27, 1901; F. Sherman.

8. **Chrysops mœchus** Osten Sacken.

*Raleigh* (E. C.). May 2, 7, 1902; common in April; also May 13, 22, 1903; C. S. Brimley.

*Winston* (C.). August 4, 1903; S. W. Foster.

9. **Chrysops niger** Macq.

*Raleigh* (E. C.). May 2, 7, 1902; common in April; also May 13, 22, 1903; C. S. Brimley.

10. **Chrysops obsoletus** Wied.

*Raleigh* (E. C.) Common. May 26 to July 31, 1902; C. S. Brimley. July 2, 3, 1903; F. Sherman.

11. **Chrysops pudicus** Osten Sacken.

Only one record. Specimen in collection of Prof. Hine.

*Raleigh* (E. C.). July 17, 1902; C. S. Brimley.

12. **Chrysops univittatus** Macq.

*Raleigh* (E. C.). Common. May 7 to July 31, 1902; in 1903 to September 3d; C. S. Brimley.

*Clayton* (E.). May 22, 1902; F. Sherman.

*Greensboro* (C.). August 25, 1902; F. Sherman.

13. **Chrysops vittatus** Wied.

*Raleigh* (E. C.) The most abundant of the genus in late summer. May 26 to July 21, 1902; C. S. Brimley. August 19, 1902; C. O. Houghton.

*Beaufort* (E.-coast). June 11, 18, 1903; F. Sherman.

*Southern Pines* (S. E.). August 15, 1902; C. O. Houghton and F. Sherman.

14. **Diachlorus ferrugatus** Fabr.

Only one record. Specimen in collection of Prof. Hine.

*Lumberton* (S. E.). July 3, 1903; F. Sherman.

15. **Tabanus allynii** Marten.

This species has not been collected by us, but is included, as North Carolina was given as the type locality by Marten in the original description (Can. Ent., vol. xv, 1883, p. 110.

16. **Tabanus americanus** Forst.

This species does not seem to be at all common, although it has been taken in several widely separated localities.

*Raleigh* (E. C.). June 19, 1902; C. S. Brimley. August 18, 1902; F. Sherman.

*Beaufort* (E.-coast). Summer of 1903. sent by Mr. Gudger, of Marine Biological Laboratory.



*Brinkleyville* (N. E.). August 6, 1902; F. Sherman.

*Highlands* (extreme S. W.; 3000 feet). August 1903;  
S. W. Foster.

17. **Tabanus atratus** Fabr.

*Raleigh* (E. C.). Rather common in late summer. June 17 to July 29, 1902; August 24, September 7, 14, 1903; C. S. Brimley.

*Thomasville* (C.). September 2, 1902; F. Sherman.

18. **Tabanus carolinensis** Macq.

*Raleigh* (E. C.). Not common. May 2, 13, 1902; C. S. Brimley. Specimen in collection of Prof. Hine.

19. **Tabanus cerastes** Osten Sacken.

*Raleigh* (E. C.). May 29, June 19, 1903; C. S. Brimley.

*Blowing Rock* (W.; 4000 feet). August 29, 1902; F. Sherman.

20. **Tabanus cinctus** Fabr.

Only one record of this rare and handsome species.

*Wilkesboro* (W.; about 2000 feet). June 21, 1901; F. Sherman.

21. **Tabanus coffeatus** Macq.

Only one record. Specimen in collection of Prof. Hine.

*Raleigh* (E. C.). July 23, 1902; F. Sherman.

22. **Tabanus costalis** Wied.

*Raleigh* (E. C.). June 9, 1903; C. S. Brimley.

*Beaufort* (E.-coast). Abundant, sharing with *T. nigrovittatus* in numbers. August 9, 11, 1902 (2 ♂♂); F. Sherman. June 15, 1903 (6 ♀); June 20, 1903 (♂); F. Sherman.

23. **Tabanus fronto** Osten Sacken.

*Raleigh* (E. C.). Abundant in late summer. July 23 to September 14, 1903; C. S. Brimley. July 15, 24, 1902; F. Sherman.

24. **Tabanus fulvulus** Wied.

*Raleigh* (E. C.). Common. June 21, 1902; May 28, June 8, 9, 1903; C. S. Brimley.

25. **Tabanus giganteus** De Geer.  
*Raleigh* (E. C.). Seems to be rare. August 24, 1903; C. S. Brimley.  
*Oakdale* (C.). August 22, 1902; F. Sherman.
26. **Tabanus gracilis** Wied.  
*Raleigh* (E. C.). July 8, 1903; C. S. Brimley.  
*Princeton* (E.). July 28, 1902; F. Sherman.  
*Brinkleyville* (N. E.). August 6, 1902; F. Sherman.
27. **Tabanus lineola** Fabr.  
*Raleigh* (E. C.). Common. June 19 to July 3, 1902; C. S. Brimley.  
*Beaufort* (E.-coast). June 20, 1903 (♂); F. Sherman.  
*Lumberton* (S. E.). July 3, 1903; F. Sherman.  
*Red Springs* (S. E.). June 21, 1902; F. Sherman.
28. **Tabanus longus** Osten Sacken.  
Widely distributed, at least in the eastern half of the State, although not known to be common.  
*Raleigh* (E. C.). August 24, 1903; C. S. Brimley.  
*Lumberton* (S. E.). July 3, 1903; F. Sherman.  
*Princeton* (E.). July 28, 1902; F. Sherman.  
*Brinkleyville* (N. E.). August 6, 1902; F. Sherman.  
*Oakdale* (C.). August 22, 1902; F. Sherman.
29. **Tabanus melanocerus** Wied.  
*Raleigh* (E. C.). Common. June 7 to July 3, 1902; C. S. Brimley.  
*Andrews* (extreme S. W.). July 24, 1901; F. Sherman.
30. **Tabanus molestus** Say.  
*Raleigh* (E. C.). Common. June 7 to July 20, 1902; June 8, 1903; C. S. Brimley.  
*Beaufort* (E.-coast). Summer of 1903; sent by Mr. Gudger, of Marine Biological Laboratory.  
*Boomer* (W.; 2000 feet). June 24, 1901; F. Sherman.
31. **Tabanus nigrescens** Pal. Beauv.  
*Raleigh* (E. C.). July 10, 1902; C. S. Brimley.  
*Greensboro* (C.). August 1902; F. Sherman.

32. **Tabanus nigrovittatus** Macq.

Prof. Hine informs us that this is a coast species, which is in accord with our only records.

*Beaufort* (E.-coast). Abundant, sharing with *T. costalis* in numbers. June 13, 15, 1903 (6 ♀); F. Sherman.

33. **Tabanus pumilis** Macq.

*Raleigh* (E. C.). May 7 to July 7, 1902; C. S. Brimley.

*Beaufort* (E.-coast). June 11, 18, 1903; F. Sherman.

34. **Tabanus recedens** Walker.

Only one record. Specimen in collection of Prof. Hine.

*Maxton* (S. E.). May 31, 1902; F. Sherman.

35. **Tabanus stygius** Say.

*Raleigh* (E. C.). This is the common large species that settles on the collector in summer in low grounds in this locality. May 30 to July 10, 1902; C. S. Brimley.

36. **Tabanus trimaculatus** Pal. Beauv.

*Raleigh* (E. C.). Common. June 7 to July 23, 1902; C. S. Brimley.

37. **Tabanus turbidus** Wied.

Only one record. Specimen in collection of Prof. Hine.

*Princeton* (E.). July 28, 1902; F. Sherman.

38. **Tabanus variegatus** Fabr.

*Raleigh* (E. C.). September 2, 26; October 2, 29, 1903; C. S. Brimley.

*Snow Camp* (C.). August 22, 1902; F. Sherman.

*Greensboro* (C.). August 1902; F. Sherman.

39. **Tabanus weidemanni** Osten Sacken.

Only the one record given below. Specimen in collection of Prof. Hine.

*Boomer* (W.; 2000 feet). June 24, 1901; F. Sherman.

40. **Tabanus** sp.

A species of *Tabanus* distinct from the others here mentioned was collected at *Raleigh* (E. C.). September 7, 1902, ♂; September 1903; by C. S. Brimley. The specimen is in the collection of Prof. Hine, and has not yet been definitely identified.

## Some Little-known Bees of the Genus *Colletes*.

BY T. D. A. COCKERELL.

The following table and notes are based on specimens in the British Museum, the species of F. Smith being represented by the types, and those of Spinola apparently by cotypes.

### *A.—Abdomen not at all blue or green.*

Large, *Andrena*-like, thorax with conspicuous ochreous or fulvous pubescence; abdomen without conspicuous continuous hair-bands, or with none . . . . . I.

Smaller, of ordinary *Colletes*-form . . . . . 3.

1. Malar space longer than broad; size larger than the others; stigma practically obsolete; second recurrent nervure with only a gentle single curve (Chile).

**nigriventris** Sm. (probably same as **nigroventris** Spinola).

Malar space much broader than long; stigma distinct . . . . . 2.

2. Abdomen distinctly subfasciate; second recurrent nervure with a strong double curve; second and third submarginal cells about equally broad above . . . . . **thoracica** Sm. ♀.

Abdomen not fasciate; second recurrent nervure with a slight double curve; second submarginal cell extremely broad, much broader than third . . . . . **intricata** Sm. ♀.

3. First abdominal segment with strong punctures; disc of thorax with ochraceous or fulvous hair, not at all mixed with black; abdomen with broad continuous hair-bands . . . . . 4.

First abdominal segment without strong punctures; disc of thorax with dull white or griseous hair, mixed with black; abdomen only subfasciate . . . . . 5.

4. Larger; stigma dark brown; thoracic pubescence short and fulvous. **perplexa** Sm. ♀.

Smaller; stigma orange-fulvous; tarsi light red. **mandibularis** Sm. ♂.

5. Abdomen obconical, shining; stigma ferruginous; hair of face dull white . . . . . **nitida** Sm. ♀.

Abdomen broader and duller; stigma very dark; hair of face longer and with much black at sides . . . . . **grisea** Sm. ♀.

### *B.—Abdomen blue or green.*

Dorsum of thorax covered with short, dense, very bright red hair; abdomen brilliant dark purple-blue; malar space fairly large, but broader than long; stigma distinct but small; second recurrent nervure with a strong double curve (Mendoza, Argentine). **bicolor** Sm. ♀.

Dorsum of thorax without such red hair . . . . . I.

1. Abdomen bluish green; malar space longer than broad; stigma small but distinct; second recurrent nervure with a double curve (Chile) . . . . . **albopilosa** Spinola.

Abdomen brilliant dark blue, shot with purple; hair of thoracic dorsum entirely black; malar space much broader than long; stigma small but distinct, second recurrent nervure only slightly curved (Chile).

**cyaniventris** Spinola (syn. of **cyanescens** Haliday).

The following additional details will be useful:

*C. ursina* Sm. ♀. Columbia. Close to *C. grisea*. Malar space very large, much longer than broad; hair of head and thorax black and grey mixed; stigma small, piceous; second recurrent nervure with a strong double curve.

*C. nitida* Sm., *C. thoracica* Sm., *C. mandibularis* Sm. (♂), and *C. perplexa* Sm., all have the malar space short, at least twice as broad as long. *C. grisea* Sm., has it large, not greatly broader than long. *C. intricata* Sm., has it fairly long, but still much broader than long.

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### Additional Dragonfly (Odonata) Records for Western Pennsylvania.

BY E. B. WILLIAMSON.

The following list of dragonflies is based on a collection from Sandy Lake, Mercer County, Pennsylvania, made by Dr. D. A. Atkinson, to whom I am indebted for the specimens. Dr. Atkinson writes me that "several coal mines drain into Sandy Lake, and the water from these has killed off (or driven away) all the fish and turtles. In adjoining swamps I took a few turtles and a number of snakes. I saw a frog, *Rana catesbiana*, catch and eat a small blue dragonfly (*Enallagma hageni* ?)."

"Man marks the earth with ruin," destroying native floras and faunas, especially in mining, manufacturing and oil-producing regions, and the captures of Odonates made by Dr. Atkinson are here recorded in the belief that at some future time, more than at present, they will be of value to the student of geographical distribution.

The dragonfly fauna changes quickly with changed envir-

ronment. The partial drainage of a swamp may result in the disappearance of certain species; the opening of a gravel-pit or the making of an artificial lake in a park may result in the almost immediate appearance of species hitherto unsuspected in the neighborhood. Every stream, bayou and ox-bow bend, every lake, pond, marsh and artificial body of water may have its peculiar species, all trace of which will sooner or later be lost by natural topographical and ecological evolution or the substitution of artificial conditions, unless some printed record be made of their occurrence. For this reason more collecting and more lists are desirable. Especially is this true in western Pennsylvania.

Dr. Atkinson collected at Sandy Lake, July 8-10, 1904. Species designated \* are additions to the list of dragonflies observed in western Pennsylvania. See ENT. NEWS, March, 1902, pp. 65-70, and April, 1902, pp. 108-113. Seventy-two species of Odonates have now been observed in this region.

1. *Lestes rectangularis*, several specimens of both sexes.
- \*2. *Argia tibialis*, two males, one female in the collection.
3. *Chromagrion conditum*, three males.
4. *Nehalennia irene*, one of each sex.
5. *Amphiagrion saucium*, one male.
6. *Enallagma hageni*, thirteen males.
7. *Cordulegaster diastatops*, one male. In the ENT. NEWS, April 1902, p. 110, No. 41, *Cordulegaster maculatus* is an incorrect determination. The specimen recorded is *C. diastatops*.
8. *Leucorhinia intacta*, four females.
9. *Sympetrum rubicundulum*, several of each sex.
10. *Sympetrum obtrusum*, three males.
- \*11. *Libellula quadrimaculata*, one male.

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### The Egg Cocoon of the Triangle Spider.

BY THEO. H. SCHEFFER, Manhattan, Kan.

From the evidence at hand it seems that nothing has ever been published concerning the cocooning habits of that interesting little orb weaver, the Triangle Spider (*Hytiotes cavatus*). The species was first described by Hentz under the name

*Cylopora cavata*, a single specimen furnishing the characters for the description. Later, 1875, Prof. G. B. Wilder of Cornell University published in the *Popular Science Monthly* a more extended description of the spider, its snare, and peculiar



Photograph by J. H. Comstock.

method of manipulating the same, referring to the species as *Hyptiotes americanus*. In this article appeared an illustration showing a tiny white cocoon suspended by two or three slender threads from a small branch of evergreen. The author thought it might be the cocoon of *Hyptiotes*, and suggested further observation to verify the conclusion.

It was my good fortune the past year, during the progress of a series of investigations begun at Ithaca, N. Y., on the cocooning habits of spiders in general, to settle the question finally, though not in favor of the cocoon referred to above. That probably belongs to one of the smaller Theridiids. Two females of *Hyptiotes*, imprisoned in glass tubes the first week in September, furnished the key to the situation by spinning a cocoon each on the cork stopper. After that, by careful search, any number could be found in the field, though nearly all noticed for a week or so were old cocoons of the previous season. They are usually located on the dead branches of pine just below a bud, where by reason of their protective coloration they are not easily seen. They are small plano-convex objects, elongate oval in outline, and resembling somewhat certain scale insects. The average length is from five-sixteenths

to three-eighths of an inch, and the width a little over one-eighth of an inch. In texture they are paper-like; in color they differ scarcely at all from the dull gray and brown of the twig. Their most distinctive feature, noticeable only on close inspection, is the presence of fine cross-striations due to very many parallel lines of silk loops or points, darker in color than the background and standing up like the pile on velvet. The flat side of the cocoon, applied to the twig, is white. Old cocoons have a weathered appearance and show little trace of the striation mentioned above. Each has also, near the down twig end, a small opening through which the young spiders escaped.

Quite a number of spiders in one locality made the mistake of attaching their cocoons to a red-painted foot-bridge across a small creek. In this situation their gray tints made them very conspicuous, in fact, noticeable at some distance.

Each cocoon contains from five to twelve pale buff eggs which adhere slightly, although they cannot be called agglutinate. A few freshly spun cocoons were found during the first half of September, but it was not until some two or three weeks later that the majority of the females laid their eggs. Upon the advent of cold weather the eggs were still unhatched, so it is likely that they remain in that condition until spring.

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## Two New Species of North American Stenopelmatinae (Orthoptera).

BY JAMES A. G. REHN.

### ***Pristocentrophilus marmoratus* n. sp.**

Type: ♂; Mountains near Claremont, Los Angeles Co., California. (C. F. Baker). Collection Academy Natural Sciences, Phila.

Allied to *P. rhoadsi* Rehn, from Uruapan, Mexico (Trans. Amer. Ent. Soc., xxix., p. 17), but differing in the slenderer antennæ, the strongly tuberculate abdomen, and the slenderer posterior tibiæ and tarsi.



Size rather small, form elongate fusiform, the dorsum very distinctly arched. Head with the vertex declivent, the acute fastigial process directed forward and downward, somewhat depressed, apex rather blunt; interspace between the eyes broad; eyes sub-trigonal, not prominent; antennæ approximately twice as long as the body; fifth palpal joint slightly longer than the third, slender, the apical two-thirds with the axis at an obtuse angle with the basal third. Pronotum strongly convex in transverse section; anterior and posterior margins truncate, lateral lobe with the inferior margin subtruncate. Mesonotum and metanotum with their exposed portions subequal; posterior margins subtruncate; lateral lobes with the inferior margin obliquely truncate, extending considerably below the level of the pronotum; surface of the mesonotum almost as smooth and glabrous as the pronotum, metanotum with the anterior portion glabrous, but bearing a transverse series of numerous low obscure tubercles. Abdomen somewhat compressed; posterior portion of the ventral surface of each segment ornamented with transverse series of irregularly sized tubercles, more distinct and more numerous than on the metanotum; cerci rather short, hardly as long as the subgenital plate; subgenital plate broad, apically with two distinct carinæ extending from the base of the styles half way to the base, apical margin broadly and shallowly emarginate; styles thick, short, apically acute. Anterior femora a third again as long as the pronotum, anterior margin with a single pre-apical spine, posterior margin unarmed. Median femora slenderer than the anterior but of the same length, anterior margin with a single pre-apical spine, posterior margin with a slender genicular spine, a distinct pre-apical spine, and several smaller depressed spines. Posterior femora about as long as the head and body united, considerably inflated, slightly more than three times as long as broad, external inferior margin very minutely serrulate; internal inferior margin very distinctly serrulate, except in the genicular portion; tibiæ about one-tenth longer than the femora slightly sinuate in the proximal half, four pair of spurs present, minor serrations distinct and sharp, calcaria with the medium pair over twice the length of the others, under surface with six paired adpressed spines on the apical section; metatarsi slightly longer than the remaining tarsal joints combined, second over twice the size of the third.

General color ochraceous and ochraceous-buff marbled and finely sprinkled with blackish brown; posterior femora with the scalariform markings distinct, and the posterior tibiæ rather imperfectly annulate.

## MEASUREMENTS.

Length of body . . . . .	10. mm.
Length of pronotum . . . . .	3.5 "
Greatest width of pronotum . . . . .	3.6 "
Length of posterior femora . . . . .	9.8 "
Length of posterior tibiæ . . . . .	10.5 "

***Phrixocnemis inhabilis* n. sp.**

Type: ♀; St. Louis, Missouri. November 15, 1903. Collection of Morgan Hebard.

Allied to *P. bellicosus* Scudder from Colorado, but differing chiefly in the somewhat larger size, stouter antennæ, shorter posterior femora, and more regularly disposed spurs of the posterior tibiæ.

Size medium, form obese, surface smooth. Head short and broad; vertex depressed, subvertical; interspace between the eyes very broad; eyes roughly diamond-shaped, distinctly projecting; palpi with the fifth joint very slightly longer than the third, curved, excavated below for a slight distance from the tip; antennæ about equal to the body in length. Pronotum slightly compressed, rotundato-arcuate in transverse section; anterior and posterior margins subtruncate, lateral lobes with the inferior margin truncate. Mesonotum and metanotum with the exposed portions subequal, posterior margins truncate; lateral lobes slightly deeper than those of the pronotum, inferiorly arcuate. Abdomen little compressed; supra-anal plate trigonal; cerci tapering, about half as long as the ovipositor; subgenital plate transverse, rotundate; ovipositor slightly arcuate, robust, regularly decreasing in width, slightly more than half the length of the posterior femora, apex obliquely truncate with the upper point produced into a distinct spiniform process, inner valves with five distinct apical hooks. Anterior femora slightly longer than the pronotum, inferior margins unarmed. Median femora bearing two to three spines on each of the inferior margins, no genicular spine present. Posterior femora about two-thirds the length of the body, moderately expanded, slightly more than three times as long as broad, genicular region not constricted, inferior margins moderately serrato-dentate, intervening sulcus broad; posterior tibiæ slightly shorter than the femora, moderately arcuate, four pair of strong spurs present, calcaria stout, those of the external face subequal, the internal face with the two superior ones subequal and considerably longer than the inferior one, inferior surface with an apical pair of adpressed spines, and a few inconspicuous scattered spinules; posterior metatarsi about equal to the fourth tarsal joint, second and third joints subequal.

General color ferruginous, the abdominal segments suffused with chestnut; eyes blackish.

## MEASUREMENTS.

Length of body . . . . .	11.5 mm.
Length of pronotum . . . . .	4.3 "
Greatest width of pronotum . . . . .	5.1 "
Length of posterior femora . . . . .	8.2 "
Length of posterior tibiæ . . . . .	7.2 "
Length of ovipositor . . . . .	5.5 "

# ENTOMOLOGICAL NEWS.

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[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

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**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

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PHILADELPHIA, PA., OCTOBER, 1904.

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We are pleased to see the increased interest in entomology and the rapid progress being made in almost every way. Our subscription list has grown to such an extent this year as to make Vol. XV practically out of print. More people are taking up the study than ever before, and students and collectors are turning their attention to orders other than Lepidoptera and Coleoptera. The interesting and beautiful little Micro-Lepidoptera are receiving the attention they deserve, and monographs and revisions of some of the families are promised in the near future. The insects of economic importance are being studied in a more scientific way and everywhere the study is looked upon with more respect. The subject of insects as carriers of disease is one of the greatest subjects that confronts the medical man and the zoologist at the present time, and the good already accomplished is amazing and the future full of the brightest promise.

If some one would write a sketch of the progress of entomology since about 1860 it would undoubtedly be of great interest.

## Notes and News.

### ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

DURING the summer Prof. H. F. Wickham made another collecting trip to the West. He visited chiefly the little known southern portion of Utah. He went to Utah Lake, Sevier Lake, and Little Salt Lake, in search of variations of *Cicindela echo*, and made large collections in the vicinity of St. George, Leeds and the Pine Valley Mountains.

DISPOSITION OF THE DE SELYS COLLECTION OF NEUROPTERA.—(We translate the following from the *Compte Rendu* of the meeting of the Entomological Society of Belgium, held May 7, 1904.) M. Severin announced to the meeting that the children of our lamented Honorary President, M. de Selys, have made a gift to the State Museum of the collections of Neuroptera of their father, containing the types of his descriptions and numerous types of older authors: Hagen, Latreille, Rambur, etc. M. Severin intends to entertain the Society with further details of this new addition to the national collections. The meeting received this communication with lively satisfaction, and M. Lameere proposed to direct the secretary to transmit to the de Selys family the thanks of the Society for this inestimable gift to the Museum of Natural History. The proposition was unanimously adopted. (*Annales, Soc. Ent. Belg.* xviii, p. 180).

NESTS OF ANTHIDIUM ILLUSTRE Cress.—A clay bank at Denver, Colo., furnishes a veritable mine of interest and information for the entomologist. A number of species have been taken from it. A study of their habits, life histories, enemies, etc., would furnish a full summer's work and the information obtained fill a small volume. While collecting there three years ago I took a number of woolly nests which afterwards produced specimens of the above species.

A specimen with a nest was sent to Mr. Henry L. Viereck for determination. He says that the species is undoubtedly *A. illustre* though differing in maculation, and calls attention to the fact that this case supports the (as yet unproven) theory that all species of *Anthidium* are "cottoners," *i. e.*, use a cottony substance in constructing their nests.

A number of these nests were collected and were, apparently, built in deserted burrows of *Anthophora occidentalis* with which the bank is honeycombed. In color the nests were either white or brown, the white ones predominating. A microscopical examination shows that the former are constructed of the pile which covers the galls produced by *Trypeta bigeloviae* which are abundant near the nesting place of the bee. The brown cells appear to be made from the pappus of some composite flower, the species of which we were unable to determine. The nests vary somewhat in form, but are usually cylindrical, about 20 mm. long and 8 mm. in diameter. They are placed end to end and commonly number two to four in a burrow.—S. ARTHUR JOHNSON.

*EMPHYTUS GILLETTEI* MacG. (Tenthredinidæ).—The following description, furnished by Prof. C. P. Gillette, was published in the report of the Colorado Agric. Experiment Station in December, 1902, page 13. It is reprinted here so as to make it more available for other workers.

*Emphytus gillettei*.—♀. Black, with the following parts rufous; the apex of the anterior femora, the anterior tibiæ and tarsi beneath, the apex of the middle femora, middle tibia and tarsi beneath, the posterior femora and tibiæ, and the basal segment of the posterior tarsi; with the following parts white: the tegulæ, the cenchri, the anterior trochanters at apex, the middle and posterior trochanters, and a transverse band on the base of the fifth abdominal tergum, slightly attenuated at middle; the stigma and wing veins dark brownish; the first submarginal cell more than twice the length of the second; the third segment of the antennæ slightly longer than the fourth; the clypeus roundly and deeply emarginate, the labrum filling the emargination and angulate at apex; the saw guides obtusely pointed at apex. Length 8 millimeters.—A. D. MACGILLIVRAY.

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## Entomological Literature.

THE HONEY BEE: ITS NATURAL HISTORY, ANATOMY AND PHYSIOLOGY.  
—By T. W. Cowan, F. L. S., F. G. S., F. R. M. S., etc. Illustrated with seventy-three figures and one hundred and thirty-eight illustrations. London: Houlston & Sons, Paternoster Square.

This is an excellent little work of two hundred and twenty pages. It is well indexed and gives a valuable bibliography. It is a work that every one interested in bee culture should possess, and also one that would be of value to all students of general entomology who wish information about this interesting insect.

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## Doings of Societies.

At the meeting of the Feldman Collecting Social, held June 16th, at the residence of Mr. H. W. Wenzel, 1523 South 13th Street, Philadelphia, nine persons were present.

Mr. H. Wenzel showed *Lepturges regularis*, a rare Cerambycid, from Frankford, Pa. This is the first record of the species in this vicinity.

Mr. Daecke exhibited a species of the rare Dipterous family Acroceridæ, *Oncodes costatus*, which was reported as fairly abundant at Castle Rock, Pa., June 12th, by Mr. Wenzel.

Mr. Wenzel stated that he had taken four more specimens of *Cychnus elevatus unicolor* on Five Mile Beach, N. J., on May 30th. Specimens from this locality seem to form a distinct race. The peculiarity of a cychnus living on the low coast in contrast to the usual hilly situations was referred to.

Mr. Bland referred to the scarcity of burrowing beetles near English Creek, N. J. This he ascribed to the dry sandy soil of the region, which did not permit the insects to form permanent burrows. Discussed by Messrs. Wenzel, Bland and Daecke, who referred to the more or less permanent burrows of Hymenoptera in sandy places.

Mr. Bland referred to the absence of records of Coleoptera from Burlington County in the "Catalogue of Insects of New Jersey. He had taken *Tylophorus sellatus* and *Galerucella nymphæa* abundantly in that county recently.

Dr. Castle spoke of a recent trip to Virginia. Insects were very rare.

WILLIAM J. FOX, *Secretary*.

Minutes of meetings of Brooklyn Entomological Society, held at the residence of Mr. Geo. Franck, 1040 DeKalb Ave., Brooklyn, N. Y.

January 8, 1903.—Twenty-four persons present, the President in the chair. Officers elected for the ensuing year: *President*, John B. Smith; *Vice-President*, Edward L. Graef; *Secretary*, Archibald C. Weeks; *Treasurer*, Christopher H. Roberts; *Librarian*, Richard F. Pearsall; *Curator*, Geo. Franck.

Mr. Weeks read Captain Jonathan Carver's descriptions of the seven insects observed by him in his explorations in the vicinity of the Great Lakes in 1766, and designated by him as the "Silk-worm," "Tobacco-worm," "Bee," "Lightning Bug or Fire Fly," "Water Bug," "Horned Bug or Stag Beetle," and "Locust."

Mr. Charles W. Leng stated that he had examined a large series of specimens of the genus *Hippodamia* from the United States and had reached the conclusion that divisions based on maculation alone were unreliable and that in fact not more than six good species should be recognized north of Mexico. The variation in maculation is geographical rather than structural.

• Mr. Wm. T. Davis reported the capture of *Homoglaea carnosa* Grote, and *Catocala herodias* Strecker at Lakewood, N. J.

Prof. Smith stated that *Cicindela lepida* also occurred in this

locality, a most unusual one for a species, whose normal habitat is the inner margin of ocean beaches. It is probable that at some remote period the beach line had extended inland to this point and as the waters receded this colony of beetles remained.

*February 5, 1903.*—Eighteen persons present, the President in the chair.

Mr. Wm. Beutenmüller was elected a member. Drs. Call and Love were elected members of the Executive Committee.

Discussion of Dr. Dyar's "List of North American Lepidoptera:" Messrs. Smith, Call, Franck and Weeks pronounced it, despite minor omissions, a monument indicative of the advancement of Lepidopterological science. Mr. Weeks compared Dr. Morris' check list, published forty years ago, which contained 1800 species, and his prediction that the number would eventually reach 3500, with the present work, which contained even 6000, with certainly many species yet to be added.

Prof. Smith presented a paper upon "Fossil Insects," illustrated by lantern slides, showing fossil remains of insects of all orders occurring in various strata of the tertiary and carboniferous ages. Insects at these remote periods were already well advanced in structure as well as of unusual size.

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A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia, was held May 26th. In the absence of the Director and Vice-Director, Dr. D. M. Castle presided. Ten persons were present. Dr. Skinner spoke of the peculiar habitat and geographical distribution of *Pyrgus centaureæ*, and said a knowledge of its food plant and life history would be of great interest. Mr. Frank Haimbach exhibited some recent collections of Microlepidoptera. Mr. R. Godfrey reported taking *Elater sayi* and *Sphæridium scarabæoides* in the city limits. He was the first person to report the latter species in New Jersey. Dr. Calvert exhibited some rare and interesting Odonata. He said Mr. McLachlan had described a genus and species from an unknown locality. A specimen had subsequently been received in France from Chi-

riqui. A figure of this species is given in the *Biologia Centrali-Americana*. Mr. Underwood collected four specimens of this species, *Thaumatoneura inopinata*, in Costa Rica. Two specimens of a new species of the same genus, taken by Mr. Underwood, were also exhibited.

*Aeschna sitchensis* from Pequaming, Michigan, taken by Mr. Morgan Hebard, was also shown. This is the first record for the United States. *Cordulegaster sayi*, taken by Mr. Rehn, at Thomasville, Georgia, was new to the collection. The speaker also exhibited Riker mounts of Hemiptera, Diptera, and also some insects of economic interest. Mr. Rehn exhibited Orthoptera from Mexico, collected by various persons. Among them was a new genus and species of the family Pyrgomorphini, also *Tæniopoda picticornis*, and an allied species separated as *Burmeisteri*—they show great variation in color. A new species of the genus *Stypater* was shown, being the largest known species.

HENRY SKINNER, *Recorder.*

The September meeting of the Newark Entomological Society, was held on the 11th, with President Keller in the chair, and nine members present.

The minutes of the previous meeting were read and approved.

The resignation of Mr. R. Godfrey was read and accepted.

Messrs. Brehme, Doerfel and Kraemer, were appointed a committee of three to provide for suitable quarters, lunch and refreshments for a little "time" among the members, to be held October 9th, after the regular meeting, in honor of the twentieth anniversary of the Society's organisation. Mr. Wormsbacher volunteered to furnish the music.

Mr. Buchholz reported the capture of *Acronycta funeralis* in Elizabeth, May 8th, and the emerging of a ♀ of *Smerinthus jamaicensis* from among thirty pupæ of *S. geminatus*.

Mr. Eugene Winship, of Long Branch, N. J., was proposed for membership by Mr. Brehme.

After that, adjournment upon motion.

OTTO BUCHHOLZ, *Secretary.*



# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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## Courtship of Mayflies

By R. M. MOORE, M. D.

We usually expect all courting to be done by the male sex so the following observation may be of interest as showing that some of the Ephemeridæ recognize leap year.

One warm damp evening in this June, just as I sat by my study table, close to an open widow, my attention was attracted by the dropping onto the blotter of a female *Batis propinquus* Walsh; in a moment she was followed by eight males. These alighted fairly near to the female and remained in about the same position as where they landed without showing any special excitement, occasionally waving their bodies from side to side and waving their anal setæ. The female on the contrary showed great excitement, waving her body and waving her setæ almost constantly. She seemed in this way to obtain some sense of direction, and by it to locate the position of the males. As soon as she settled where one was she would back up towards him, stopping a moment to wave her body from side to side and then continue her retrograde movement.

At no time did I see her move towards a male except by backing towards him. The males acted very ungallantly, as when she approached one near enough to touch him with her setæ, he would fly up in the air with a peculiar little hopping flight and land an inch or two away. When one rejected her advances she stood still for a moment and waved from side to side until she got the direction of another and backed towards him, only to have the same thing repeated. Once she flew out of the window alighting on the window-sill; immediately several of the males followed; she stayed on the sill but a minute or two, then flew onto the blotter again, bringing her train of admirers with her. I then captured her and her following. Once again during the evening a female flew into the window followed by four males; they remained for two or three minutes and then flew away. Although the window was open and the gas burning until after midnight, at no time did any of the males come in except they were preceded by a female.

The insects I sent to Mr. Nathan Banks who kindly determined the species for me.

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## The "Yellow-Fly" of the Dismal Swamp

BY NATHAN BANKS

Several times I have heard those who have travelled in the Dismal Swamp tell of the "yellow fly" which infests that region at certain times of the year. All accounts had put it down as one of the worst biting flies known to the traveller. Specimens, however, were never available, and until lately I supposed it was some local species of *Chrysops*. Recently a friend visited the region and was severely bitten; he obtained specimens, and these, on examination, prove to be *Diachlorus ferrugatus* Fabr., a Tabanid more closely allied to *Tabanus* than to *Chrysops*.

This species has been reported from Mexico, Florida and the Carolinas. The specimens sent me came from the Virginia portion of the swamp, and were taken about the 14th of

July. The fly is mostly yellow, with a brown tip to the abdomen, and the tip of the antennæ likewise brown; the legs are yellow, except the front tibiæ and tarsi, and the apical part of the middle and hind tarsi are blackish. The hind tibiæ are also sometimes black in part. The wings have a faintly yellowish tinge on the base, with a brown stigmal mark, and the apex beyond end of second longitudinal vein blackish. The eyes in death, are green, with blue bands; one near the hind margin, another parallel to it across middle of eye, and giving off a branch forward to the anterior corner of the eye, near the callosity.

According to local statements this fly is supposed to breed in the juniper tree, but probably does in the water. It appears about the first of July and remains about one month, disappearing after a heavy rain near the first of August. They are most vicious at and near twilight, and rarely noticed during the hot part of the day. It is stated that they do not attack horses or cattle, but sometimes assail dogs; the human species, at rest after the day's labor, seems, however, to be their particular hobby. They do not fly far, and houses one half mile away from an infested locality may be exempt from their invasions.

They settle on the hands or face, insert the lancets of their beak, and suck up the blood. If allowed to suck their fill in peace, the spot is not very painful, and does not remain long. But if they are disturbed, as is usually the case, the spot swells, becomes inflamed, and itches fearfully, according to reports. I have seen the red, swollen spots upon the hand of a person twelve days after being bitten. It would seem that when inserting the lancets they inject a small quantity of saliva or some poisonous fluid; that if disturbed, they leave this liquid in the bite to cause trouble; but if allowed to suck their fill most of this fluid or inflammatory matter is sucked out with the blood. This of course is a natural inducement for the host to leave the fly undisturbed, resulting in greater benefit to the fly, and lesser pain to the host.

Much remains to be learned regarding the "Yellow-fly," but its name is now known.

## New Genera of Bees.

BY T. D. A. COCKERELL,

### **CLADOCERAPIS** n. g.

Male with joints of flagellum with processes directed forwards, on upper side, and large branches bearing little filament-like processes, often forked, on under side; area of metathorax smooth and shining, with an obscure transverse ridge; basal nervure meeting transverse medial; first recurrent nervure joining middle of second submarginal cell; second recurrent nervure entering third submarginal cell a short distance from its end. Type *Cladocerapis cladocerus* (*Lamprocolletes cladocerus*, Smith, 1862). Australia. Type of species examined in British Museum.

### **TRICHOCERAPIS** n. g.

Male with antennal joints 10 to 12 reduced to mere threads, ciliate on one side; joint 13 an oval flat dark disc; wings very hairy; malar space large, in the type species black, contrasting with the adjacent yellow mandible.

Type *Trichocerapis mirabilis* (*Tetralonia mirabilis*, Smith, 1865) Brazil. Type of species examined in British Museum. The structure of the antennæ reminds one of *Thaumatosoma*.

### **HYPANTHIDIUM** n. g.

Second recurrent nervure passing well beyond second submarginal cell, as in *Dianthidium*, but no pulvillus; apex of male abdomen bilobed or entire. Type *Hypanthidium flavomarginatum* (*Anthidium flavomarginatum*, Smith, 1879). Brazil. Also includes *H. elegantulum* (Smith), *H. flavopictum* (Smith), and *H. guttatum* (Latr), all hitherto referred to *Anthidium*. I strongly suspect that *flavopictum* is the male of *elegantulum*.

### **HETERANTHIDIUM** n. g.

Second recurrent nervure meeting second transverse cubital, as in *Anthidium*, s. str., but a large pulvillus on feet. End of male abdomen pointed. Type *Heteranthidium dorsale* (*Anthidium dorsale*, Lep. Sm.). Georgia.

## New California Thysanoptera.

BY S. M. DANIEL.

Four species of Thysanoptera have been recorded from California: *Euthrips occidentalis*, *Euthrips tritici*, *Thrips tabaci* and *Heliethrips fasciatus*. To this list I am able to add *Heliethrips hæmorrhoidalis* and the four new species *Criptothrips californicus*, *Euthrips pyri*, *Sericothrips apteris* and *Caliothrips woodworthi*.

Our species may be distinguished by the following synopsis:

Female without ovipositor (Phlæothripidæ). . . . . **Criptothrips.**

**Criptothrips californicus** nov. sp.

*Female*.—Length 1.7 mm. ; width 0.3 mm. ; general color black, dark brown under the microscope.

Head cylindrical, 0.3 mm. long, 0.15 mm. wide, about as wide as prothorax is long. Cheeks almost straight and nearly parallel, set with a few minute spines; surface of head finely cross-striated. Eyes quite large, occupying about three-fifths the width of the head, quite finely faceted and protruding very slightly; ocelli situated far forward, posterior ocelli close to margin of eyes, front one on apex of prolonged vertex of head, color same as that of second antennal segment. Antennæ inserted below vertex, approximate at base, about one and one-half times as long as head, eight-segmented; length of segments: 31, 53, 79, 68, 58, 31, 45, 31. First segment concolorous with head, second base concolorous with first, apex light brown, third and base of fourth and fifth pale yellow, the rest of the antennæ shading to dark brown. Spines and sense cones quite prominent.

Prothorax comparatively small, about one-half length of head. One prominent spine at each posterior angle, anterior marginal and mid-lateral spines wanting. Surface finely cross-striated. Pterothorax approximately as wide as abdomen, nearly cylindrical, narrowing abruptly in front, gradually behind. Wings extending to about the seventh segment, fringe long and wavy. Legs long and slender; fore coxa projecting strongly, fore femora scarcely thickened. Femur, tibia and tarsus bare, with the exception of a number of small spines, more numerous and longer on fore tibia than on the others. Legs concolorous with body.

Abdomen long and slender, cylindrical to about the seventh segment, a little more than twice as wide as head; from this segment tapers gradually to tube. Tube a little more than half the length of head, sides straight, converging slightly, width at middle about one-fourth that of head; four terminal hairs approximately as long as tube, six shorter ones. Spines at sides of abdomen slender, pale, prominent, two on sides of each segment. Segments overlapping considerably; sides of abdomen black, shading to russet-brown at center.

This species is not uncommon at Berkeley and in Southern California, being found on Orange and other trees infected with the black scale (*Saissetia oleæ*). It is found very commonly beneath the old scale, among the eggs, probably feeding on them.

Female with ovipositor down-curved (Thripidæ).

Antennæ with seven segments . . . . . **Thrips.**

Antennæ with eight segments.

Body with markedly reticulate surface . . . . . **Heliothrips.**

Body not reticulate.

Abdomen clothed with fine hairs and having a silky lustre.

**Sericothrips.**

Abdomen without such clothing . . . . . **Euthrips.**

**Thrips tabaci** Lindeman,

Food-plants: onion, cabbage and chrysanthemum.

*Hab.*—San Francisco and Berkeley.

#### **HELIOTHRIPS.**

Antennæ about twice as long as head . . . . . **hæmorrhoidalis.**

Food-plants: cherry-laurel and lauræstina.

*Hab.*—Berkeley.

Antennæ two and one-half times as long as head . . . . . **fasciatus.**

Food-plants: Orange leaf infested with *Aspidiotus aurantii*.

*Hab.*—Yuba County.

#### **EUTHRIPS.**

Seventh antennal segment about as long as eighth . . . . . **pyri.**

Seventh antennal segment about twice as long as eighth.

Fifth antennal segment about five-sixths as long as fourth.....**occidentalis.**

Food-plants: orange, milkweed and various weeds.

*Hab.*—Berkeley, Pomona and Lake County.

Fifth antennal segment two-thirds as long as fourth . . . . . **tritici.**

Food-plants: rose, both cultivated and wild, bean, tomato, apple and myrtle.

*Hab.*—Berkeley, Watsonville, San Francisco and Lake Co.

**Euthrips pyri** nov. sp.

*Female.*—Length 1.26 mm.; width of mesothorax .32 mm.; general color dark brown. Head about as long as broad; cheeks convexed; anterior margin broad, acutely angular; back of head transversely wrinkled,

and bearing a few minute spines. Eyes medium, black, with light borders rounded or oval in outline, coarsely faceted, hairy. Ocelli yellow, margined inwardly with reddish brown crescents, widely separated, posterior ones contiguous, with light borders around eyes; one very long slender spine on each side midway between ocelli. Mouth cone pointed, tipped with black; maxillary palpi 3-segmented. Antennæ 8-segmented, approximate, slightly over twice the length of head. Length of segments: 33, 43, 55, 52, 35, 50, 8, 10. Antennæ brown, except segment three which is yellow. Spines pale, conspicuous, special sense organs on segments three and four.

Prothorax longer and wider than head; bears many prominent spines, the one at each anterior angle, and the two at each posterior angle are longest. Color, yellow-brown; faintly cross-striated.

Mesothorax approximately as wide as antennæ are long; front angles obtusely rounded; metanotal plate bears four spines close to front edge, middle pair equal in size and prominence to those at the angles of prothorax, the others are small; pterothorax yellow-brown, transversely wrinkled.

Wings present, extending slightly beyond abdomen, about twelve times as long as wide, pointed at ends; surface of wings thickly covered with minute brown spines; both longitudinal veins and costa of forewings thickly set with quite long, brown-colored spines, placed regularly on costa and hind vein; costa has from 29-33 spines, fore-vein 12-15, and hind vein 15-16; veins not prominent; costal fringe of fore wings about twice as long as costal spines.

Legs moderately long, scarcely thickened; femora and all except the terminal part of tibia brown; terminal part and tibiæ and tarsi yellow, a double row of twelve strong spines on the inner side of hind tibia, several inconspicuous spines on fore and middle pairs.

Abdomen about two and one-half times as long as width of mesothorax, cylindrical to eighth segment, then abruptly pointed. Spines on sides and around tip of abdomen dark brown, conspicuous; those on last two segments are long and approximately equal. Color of abdomen dark brown, connective tissue yellow.

Found on pear blossoms, San Leandro.

**Sericothrips apteris** nov. sp.

*Female*.—Length 0.745 mm. (0.65-0.84 mm.), width 0.34 mm.. General color very dark brown, nearly black.

Head 0.39 mm. long, 0.289 mm. wide, broadest just under the eyes retracted slightly into prothorax, cheeks convex, converging very slightly posteriorly, anterior margin slightly depressed at the insertion of the antennæ. Spines upon the head inconspicuous, a few small ones upon the cheeks. Head dark brown, nearly black. Eyes moderately large, dark, cornea appears as a light colored margin about the eye; coarsely faceted,

occupying about one-half the width of the head. Ocelli wanting. Mouth cone long, extending to mesothorax, tipped with black; maxillary palpi three segmented. Antennæ eight segmented, bases separated by one-half width of basal segment. Length of segments: 34, 59, 89, 68, 76, 119, 25, 42. Two basal segments broadest. First segment brown, second and third yellow, base and sides shaded with brown, other segments brown, the fourth being a shade lighter. Spines conspicuous, having become specialized as sense organs on segments three to eight.

Prothorax about four-fifths length of head, and twice as broad as long, widest in the middle, tapering abruptly to the head, less abruptly posteriorly. Each anterior angle bears a pair of short, divergently curved spines, one curved spine at each posterior angle. Color dark brown. Meso- and metathorax as long as head, diverging posteriorly, only a little wider than prothorax; color dark brown; surface marked with transverse reticulating wrinkles appearing like striæ in dorsal view. Wings wanting. Legs about same thickness; hind pair somewhat longer than the other two. Femora brown, tibiæ brown, shading into yellow, tarsi yellow, brown at extreme tip.

Spines prominent and numerous on tibiæ, one especially well defined, at the posterior angle of the tibia of the third pair of legs.

Abdomen about one-half as broad as long; black, with silky lustre, a transverse row of twelve dark brown spines, regularly spaced, across segments two to seven. One long spine on the lateral margin of each segment; narrow, dark brown, transverse reticulate wrinkles appearing as striæ on first seven segments. Spines on last two segments comparatively short but strong.

Very common at Berkeley on grass in winter and spring.

Female with ovipositor upcurved (*Æolothripidæ*) . . . . **Caliothrips.**

#### **CALIOTHRIPS** nov. gen.

Entire surface of insect faintly reticulate and coarsely punctate with the exception of the tibiæ and tarsi. Head slightly wider than long. Ocelli present. Antennæ 9-segmented, the last three being much shorter and closely joined, the third and fourth segments are equal in length and longer than any of the others. Prothorax a little shorter than the head, without large bristles.

Legs long and slender, bearing a stout spine at the base of the posterior tibia, femora unarmed. Wings present, pointed at tip; anterior wings with strong veins consisting of a ring vein and one longitudinal vein, the longitudinal bearing stout spines almost to the tip. Both wings are thickly set with



short hairs. Fringe on posterior margin wavy. Wings white; fore wings with two broad dark cross bands.

Abdomen with posterior margin of segments serrate, these serrations becoming acuminate in the last five.

***Caliothrips woodworthi.***

*Female.*—Length 0.91 mm.; width of mesothorax 0.31 mm. General color yellowish brown to brown.

Head slightly wider than long, rectangular in outline; not retracted into prothorax; cheeks nearly straight; surface of head reticulate and closely punctate. Eyes large, black, circular, borders light, coarsely faceted; ocelli of medium size, yellow, and placed quite close together. Mouth cone sharply pointed, maxillary palpi geniculate, 3 segmented. Antennæ 9-segmented, a little over three times as long as head, slender, approximate at the base; length of segments: 19, 35, 49, 49, 39, 32, 14, 11, 18. Segments 1 and 2 cylindrical, light brown in color; second of little greater diameter than first; center of segments 3 and 4 nearly twice the diameter of extremities, brown shading to yellow; segment 5 light at base, apex concolorous with segments six to nine inclusive (dark brown). Sense cones on segments 2 to 6 inclusive with portion beyond middle of segments 3 to 6 bearing sense hairs.

Prothorax about twice as broad as long, a little wider than head, sides slightly arched, no conspicuous spines, but several weak ones. Mesothorax smoothly rounded at the anterior angles. Metathorax slightly narrower than mesothorax and tapering posteriorly. Entire surface of thorax faintly reticulate and coarsely punctate. Wings long, extending beyond tip of abdomen, narrow, pointed at tip; fore wings with strong veins; fringe on posterior margin long and wavy, about four times as long as that on anterior margin; anterior wings with two white bands, one at the base and one just beyond the middle, with a dark brown band between the white ones, and one at the apex of the wing. Hind wings without these areas.

Legs pale yellow, except the middle of the femora and tibiæ, where they are concolorous with thorax. Femora coarsely punctate and faintly reticulate; tibiæ clothed with several small hairs; the under side of the hind tibia bears a row of spines, the last being the longest and stoutest.

Abdomen obtusely conical, twice as long as wide, about the length of the insect, brown, surface faintly reticulate and coarsely punctate. Segments gradually increase up to 4th, then gradually decrease to tip. Segments overlap considerably; serrate, serrations appearing as strong spines on the edges of segments 4 to 8 inclusive. Spines on last 2 segments fine lemon yellow, inconspicuous. Transverse oval areas in the middle of segments 2 to 6, yellowish.

Found on grass in Berkeley.

## A New *Thecla* from the Northwest.

By HENRY SKINNER

***Thecla Johnsoni*** n. s.p. ♀.—Eyes surrounded by a white ring; palpi brown, clothed with numerous white scales; antennæ annulate, black and white, tip black; body brown; legs annulate, black and white. *Upperside* of primaries reddish brown, slightly darker along the costa, marginal line black, immaculate. Secondaries reddish brown, immaculate; marginal line black; a fine black tail with a white tip and above it an aborted tail with a white tip; between the tail and the anal angle the margin is clothed with long black and white hairs or scales. There are also some white scales at anal angle on inner side of the black marginal line. Underside is the same color as above but differs in having on the primaries a curved line of white spots running from the costa nearly to the inner margin, and curving parallel to the other margin. This line is above an eighth of an inch from the edge of the wing. There is a similar line or row of white spots on the secondaries extending from the costa to the inner margin; the white linear spots are not as contiguous as in the primaries, the fifth from costa being quite out of line and the last one is longer than any of the others. Marginal line black with a fine white line on either side; the marginal line ends at anal angle in a dense black spot. There are four small spots between the white line and the margin, upper three black with obsolete centres, and the fourth white and above the anal angle. The male is like the female but smaller and darker in color, being dark brown. It has the usual sexual spot. The expanse of one forewing of the female is 15.3 mm. and that of one forewing of the male is 14 mm.

The female bears a label British Columbia, and I have had the specimen many years and knew nothing about it. The male was sent to me by Professor O. B. Johnson, of Seattle, Washington, with the following remarks: "The larvæ were collected July 15, 1891, by C. V. Piper, one of my pupils, while collecting botanical material. They were found on *Arceuthobium douglassii* Engl. a parasitic plant belonging to the order Loranthaceæ, that is found on our hemlock, *Tsuga mertensiana*. He brought me but three larvæ and enough of the plant to feed them to maturity—one I inflated immediately, one I killed in the pupa state, while the last emerged imperfectly. While alive and feeding the mimicry or resemblance to the plant is most remarkable, not only in coloring which is a yellowish green in the plant and duplicated in the insect, but with dark hastate markings which imitate the shaded portions between the leaf clusters. I have been waiting all

these years for more material but have not been fortunate enough to find any." This species is marked on the underside like *Thecla spinetorum* Bois. and it is just possible that it may be a color phase of it.

### Dysphaga tenuipes Hald.

Brief Notes; Record of a Parasite.

BY A. ARSENE GIRAULT.

A small branch ( $\frac{1}{2}$  inch diameter) of a species of oak on the campus of the Virginia Polytechnic Institute at Blacksburg, Va., was found infested with several species of wood-boring *Coleoptera*, which when bred, proved to be the following species\*: *Stephanoderes quercus* Hopk, MS.; *Micrasis opacicollis* Lec.; *Anthribus cornutus* Say; *Dysphaga tenuipes* Hald. †

The bare and dead branch, and the conspicuous, fine, impalpable, flour-like, wood-dust on the leaves and ground below the branch were the indications of attack. But a single branch was found infested; this was cut into convenient lengths, and put in a glass jar covered with cheese cloth, and filled with moist earth. This jar was kept in the laboratory, and on the following dates adults of *Dysphaga tenuipes* were excluded: 21, 24 Nov., 1902; 11, 14, 17, 19, 23, 28 February, 1903, those appearing on the latter date (28 February), excluded in the green-house, 14 specimens were obtained, ♂'s, ♀'s.

After remaining in the laboratory from 5 September, 1902, until 25 February, 1903, they were removed to a green-house, where the temperature ranged from 90-100° Fahr., during the day. Here they were supplied with fresh twigs; and here they had plenty of sun-light (got very little, if any, before), and soon became active, flying along the sides of the jar as do moths, making quite a distinct buzzing sound, and resembling small Sesiids on the wing.

After this, a supposed attempt at copulation was observed, but beyond that, no signs of continued breeding were ever

\* Letter U. S. Dept., Agr, Div., Ent., 18 Nov. 1902. Webb, J. L., Detr., by Schwarz.

† Letter U. S. Dept., Agr., Div., Ent., 8 Dec., 1902. Hopkins, A. D., Detr., by Schwarz.

indicated, and this species is doubtless very difficult to rear in confinement, dying in a few days of vain efforts to escape.

Adult exclusion was observed on 24 November, 1902. The pupal integument is very thin. The wings are the last to be excluded, and in order to free them, necessarily, the insect has to bend sharply back, so that the dorsal portions of the head approximate the dorso-caudal portions of the abdomen. After exclusion, the body is pale, excepting parts of the head, which are black. The normal colors appear after from two to three days; a short while after emergence, the minute elytra become black-blue, remaining thus for a day or so.

Larva :—Resembles the round-headed borers (e. g. *Saperda*), but is much shorter and assumes a curled position.

Pupa :—Long, straight, and regular in outline; slightly narrowing at thorax (lateral aspect); cerambycid in form; eyes pinkish; tip of abdomen blunt, armed with small bristles, with which the pupa can move about to a limited extent, white. Length, .25 — .313 inches.

When ready to molt, the hands of an artist only could come anywhere near doing justice to its exquisite and delicate beauty, its varying blends of color. The abdomen and ground color of thorax are a strong straw yellow, while the appendages are nicely shaded with blue; eyes large and bright brown; tips of mandible reddish.

The pupa is formed just under a thin expanse of bark, in a small chamber, plugged with a mass of wood fibres.

Parasite :—Parasites appeared from the infested twigs on the 15 February, 1903. They proved to be males of a new *Pltinobius*, and were given the specific name *dysphagae* by Dr. Ashmead, to whom they were sent for determination. I advanced a doubt as to their being *Dysphaga* parasites, after they were named, but as they are much too large to be parasitic on Scolytids, and as the Anthribids had disappeared the previous fall, I think there can be, with reasonable certainty, no doubt of it. Two (2) males were obtained; "the ♀ should have spotted wings." † Type in the United States National Museum.

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† Letter U. S. N. M., 25 March, 1903, William H. Ashmead.

## Notes on the Life History of *Polychrysia formosa* Gr.

BY W. D. KEARFOTT.

At the Southern end of Greenwood Lake, N. J., May 20, 1901, while digging up some plants of large yellow Ladies' Slipper (probably *Cypripedium hirsutum* Mill.) I in some way disturbed the repose of a singularly shaped larva, which fell to the ground close to my hand; the nearest plant was a low-growing huckleberry shrub, (probably *Vaccinium nigrum* Wood or *vacillans* Kalm) some of the leaves of which were enclosed in box with the larva, and as it freely ate them, I have no doubt it is the food-plant.

Not appreciating the rarity of the larva, the moth from which was later identified by Professor John B. Smith, I made no detailed description of it, but the following notes may be sufficient for others to recognize it if found:

Shape:—Like a much flattened triangle. The head is small, and each segment to anal end slightly higher than the one before it. The anal segment is three to four times the height of head and segment 2, and it ends in a vertical line, as if cut off with a knife at right angles to the body.

Color:—Pea-green, with whitish wavy dorsal band and whitish wavy circumferential bands around each segment. Length about 25 mm. Head bright green and very small.

About May 27th the larva spun a loose cottony cocoon of white silk and a day or two later pupated. The cocoon was loosely woven, roughly oval, about 25 by 20 mm. and consisting of an outer wrapper rather evenly woven, in which were inserted at about equal intervals a number (about 35) of tiny pure white knots of silk, the inner covering rather loosely woven, and the pupa was clearly visible through both. A fine ♂ moth issued June 14, 1901, the pupa still remaining in the cocoon.

Notes of larva skin:—Head 1.6 mm. wide by 2 mm. long, rounded, slightly bilobed or cleft by paraclypeal suture, lobes rounded, clypeus triangular, apex reaching to within one-third of top. Mandibles dark brown, four indentations making five teeth or points on each. Antennæ short. Setæ on head and

skin pale, very short, not longer than 1 mm. Neither prothoracic nor anal shield chitinous.

Pupa, from empty shell:—Fifteen mm. long to tip of cremaster; 4 mm. wide across thorax by 3 mm. thick. Abdominal segments tapering to a point. General shape slender and elegant. Head and eye-caps make a triangular anterior projection. Cremaster .75 mm. long, armed with two large hooks and four smaller ones.

Color of pupa whitish green, on upper side of thorax and dorsal side of all abdominal segments, except 12 and 13, is a black-brown patch, averaging 2 mm. in width, interrupted by a small clear spot on posterior edge of thorax; the same spots are repeated on first and second abdominal segments and on margin of patch about centre of thorax. On the last abdominal segment is a small dorsal spot of the same black-brown color. The appearance of this patch is, as if the pupa had been held for a moment, dorsum down, in cold-tar or pitch, and in very striking contrast with the nearly white color. Setæ on pupa very minute.

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## A New Torymid from Utah.

By W. H. ASHMEAD.

**Torymus wickhami**, new species.

♀.—Length 4.5 mm; ovipositor nearly 4 mm. Head and thorax blue, closely punctate or shagreened, with sometimes a faint greenish tinge in certain lights, and clothed with a fine, short, glittering white pubescence; eyes brown, the malar space distinct; ocelli pale; flagellum black or brown-black, the scape blue with a yellow spot at base; abdomen wholly reddish-yellow, with the sheaths of the ovipositor black; legs with the coxæ and femora blue, the tibiæ and tarsi yellowish, wings hyaline, the veins brown-black.

Type.—No. 8133, U. S. N. M.

Milford, Utah. Described from two specimens taken July 7, 1904, by Professor H. F. Wickham, and in honor of whom this lovely species is named.

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ON PAGE 271 of ENT. NEWS for October 1904, there is an error in the Raleigh records of *Chrysops moechus*, our only record for this species at Raleigh is September 3, 1903, but in Mr. Sherman's paper the whole records for *Chrysops niger* at Raleigh are through some slip given for *moechus* also.—C. S. BRIMLEY.

## Descriptions of New Oscinidae.

BY C. F. ADAMS.

Zoology Building, University of Chicago, Chicago, Illinois.

In some preliminary studies of the Hough collection of *Diptera*, now in the University of Chicago, I have come across some new forms of *Oscinidae*, the description of which I take pleasure in presenting here. The one described under the name of *pulla* belongs to the subgenus *Chloropisca*, and is close to my *halteralis* from Arizona. Those under the names of *lasciva*, *rubrivittata*, *annulata*, and *certima* belong to *Chlorops*, sens. str., the last named standing close to *aristalis* Coq., and the others near *pubescens* Loew, and *palpalis* Adams.

**Chlorops pulla** n. sp.

Head reddish yellow, frontal triangle shining black, punctate on the margins, sides converge gradually, and reach the anterior edge of the front, which slightly overhangs the base of the antennæ; latter black, reddish on lower margins, third joint orbicular, arista dark yellowish; facial ridges tinged with brown, clypeus black, palpi very small, brownish black, proboscis concolorous; upper half of occiput black. Mesonotum very dark reddish brown, shining, with three large and two small black vittæ, of the former the middle one is short, reaching from anterior margin to middle of mesonotum, the other two reaching from the posterior margin nearly to the humeri. the humeri largely shining black; pleura reddish yellow, a large and indistinct spot below and before the base of the wing, and the lower half of the sternopleura black; scutellum same color as mesonotum; halteres yellow. Abdomen subshining black, tip reddish yellow. Legs shining black, tip of coxæ, and knees reddish, tarsi fuscous. Wings hyaline, veins brown, third and fourth slightly divergent, hind cross vein twice its length from the small cross vein. Length 2.5 mm.

Two specimens. Colorado.

**Chlorops lasciva** n. sp.

A rather robust species, reddish yellow, abdomen reddish brown centrally. the incisures brown. Third antennal joint, lower angle and lateral margins of triangle, ocellar dot, two triangular vittæ on upper part of occiput, and palpi black. Arista whitish, base yellow; median carina of face rather prominent. Thorax with three shining black vittæ, and a very indistinct strigula above each wing, median vitta reaching two-thirds way to posterior margin and lateral vittæ reaching only three-fourths; pleura, humeri, and scutellum immaculate, metanotum black, halteres light yellow. Second abdominal segment with a black spot in each anterior angle. Legs yellowish, tips of tarsi fuscous. Wings hyaline, third and fourth veins slightly divergent, hind cross vein twice its length from the small cross vein. Length 3.4 mm.

One specimen. Opelousas, La., March.

***Chlorops rubrivittata* n. sp.**

Head yellow, frontal triangle shining, spot in lower angle, and ocellar tubercle black; first two antennal joints yellow, third black, orbicular, arista white, base yellow; face and cheeks light yellow; palpi black, proboscis and clypeus yellow; occiput with two black vittæ above. Thorax yellow, the three vittæ and the two strigulæ on mesonotum reddish; pleura immaculate, halteres and scutellum yellow; metanotum black. Abdomen yellow, a spot on each anterior angle of the second segment, and bases of the following segments black. Legs wholly yellow. Wings hyaline, veins brown, third and fourth veins slightly divergent, hind cross vein twice its length from the small cross vein. Length 3 mm.

Four specimens. Opelousas, La. April.

***Chlorops annulata* n. sp.**

Head yellow, frontal triangle shining, reaching three fourths way to antennæ, each angle, lateral margins narrowly, and ocellar tubercle black, occiput blackish centrally, with two black lines extending to vertex: first two joints of antennæ yellow, third black, orbicular, arista white, base yellow, palpi rather large, black, proboscis reddish, clypeus yellow, face and cheeks light yellow. Thorax yellow, mesonotum subshining, with the usual three large black vittæ and two strigulæ above base of wings, the central one reaching almost to the scutellum, humeri each with a black dot; pleura with four prominent black spots; scutellum and halteres yellow; metanotum black. Basal half of abdominal segments subopaque black, apical half yellow. Legs yellow, femora and tibiæ each with a black band, tips of tarsi fuscous. Wings hyaline, veins brown, third and fourth veins slightly divergent, hind cross vein nearly twice its length from the small cross vein. Length 3 mm.

One specimen. Opelousas, La. April.

***Chlorops certima* n. sp.**

Head yellow, third antennal joint, a spot in anterior angle of triangle, vertex, occiput except sides and lower part, and clypeus black; face and cheeks whitish yellow, frontal triangle shining, reaching almost to the anterior margin of front; third antennal joint orbicular, arista whitish, base yellow. Thorax yellow; mesonotum with three broad and two short and narrow vittæ, the central one reaching three-fourths distance to posterior margin, humeri without markings; pleura with one black spot; scutellum blackish on sides at base, metanotum black, halteres yellow. Abdomen dull yellow, basal third of second and following segments, and an indistinct spot in center of each, black, the second segment also with a black spot in each anterior angle. Legs yellow, tips of tarsi fuscous. Wings hyaline, third and fourth veins slightly divergent, hind cross vein twice its length from the small cross vein. Length 3 mm.

One specimen. New Bedford, Mass. June.



# ENTOMOLOGICAL NEWS.

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PHILADELPHIA, PA., NOVEMBER, 1904.

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Some short descriptions of new forms we see in print, leave out entirely even structures used as generic characters in modern restricted genera. The fact that this state of affairs exists warrants more than any other reason, unless it be that of convenience in referring to a species whose exact position in the classification is intended to be conveyed at once, the recent subdivision of the old heterogeneous genera into smaller genera, each based upon some salient structural character. This scheme tends to empty the group characteristics of a species into the generic diagnosis and forces upon the student the recognition of characters too often absent from descriptions. In describing a species an author should test all characters previously employed. This done, he should endeavor to throw more light upon structures not yet used. This seems to be the only way to do work of a creditable character.

H. L. V.

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I SEE in your September Number an article in reference to the use of felt as a substitute for cork in making double mounts. Now I have stumbled on to a substitute that is cheap, easily procured in almost every part of the country and answers the purpose to perfection. I mean birch-bark; it is the nearest substitute for cork obtainable, it is white and requires no preparation, and will not spoil by keeping.—JOSEPH H. READING.

## Notes and News.

### ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

**THE LEAD-EATING WASP.**—Insect which spoiled Telephone Cables in China.—According to the *Electrical World*, the China and Japan Telephone Company, of Shanghai, China, was much troubled several years ago through the perforation of the lead sheathing of its aerial cables by a number of small holes near every clump of bamboos by which the line passed. These were assumed to be due to small rifle bullets, and a reward was offered for the conviction of anyone molesting the cables. This did not stop the trouble, and it was finally discovered that the holes were made by a species of wasp, which, apparently mistaking the lead (or preferring it) for the bamboo stem in which it normally lays its eggs, bit holes in the insulation and deposited its eggs about the telephone wires. Hemp cloth and linseed oil were substituted for the lead, apparently with satisfactory results.

**A FORCEPS NET.**—The American Entomological Company's forceps net, catalogue number 123, is an excellent device for capturing different kinds of frail insects, such as small moths and mosquitoes, also stinging insects. The writer has used it for several years and with some practice has attained a degree of skill that will insure the capture of the specimens in perfect condition. When these specimens are to be removed from the net, however, accidents frequently occur that will mutilate the insects so that they are spoiled for the collection. The following modification of the net was, therefore, used this past season with better success. Attach to the gauze, in the center of one of the rings a tin tube from one-half to one inch long, which fits the inside of the neck of the cyanide bottle. Close the end of the tube with a cork or a tin cap. Cut a hole in the gauze inside of the area of attachment so that the specimens can be transferred through the tube. Close the net and fasten securely around the scissor handle at the widest point near the rings, a copper wire which will hold the net securely closed. When the insect is to be captured shift the wire collar back to where the handles cross and it will allow the net freedom in opening and closing. Capture the insect and slide the collar forward to the rings; this will lock the insect into the net and both hands are set at liberty. Remove the cover of the tube, insert it into the neck of the cyanide bottle, and transfer the specimen with safety.

Instead of the tube a tin pepper box of proper size can be used for the purpose. If the tube is not too long it will not handicap the manipulations of the net among twigs. The collar is made of light copper wire wrapped around the handle several times. It will adjust itself to the shape of the handles; it should slide easily but not by itself.—ALBERT F. CONRADI, College Station, Texas.

"PROTECTIVE RESEMBLANCE" IN ARIZONA.—Some years ago an esteemed collector of the earlier day printed a little booklet on the birds of Iowa, which was dubbed by Dr. Elliott Coues "the offspring of a fading memory." A perusal of the recent article by Dr. Kunze (in September News) leads us to wonder whether that gentleman may not have given us an intellectual production deserving, in charity, the same appellation. Referring to the Coleoptera alone, one finds scientific names used which either exist not at all or must be grossly misapplied. What is "*Sphænotica saturnalis*" for instance? Possibly *Sphænothecus suturalis* is meant, but it is a risky guess. Then one who has ever seen *Psiloptera drummondi* may be pardoned for refusing to believe that this insect is "a black Buprestid with an orange stripe across the thorax" while its companion, "*Chrysobothris 8-punctata*" is a total stranger to our lists. We may presume that in the latter case the Doctor meant to refer to *C. octocola*—but we can't be sure. Another name which evidently owes its origin to this article is "*Plusiotis worthii*" which we may assume to be an attempt to write *Plusiotis woodii*. May we be permitted to doubt the occurrence of *Polyphylla variolosa* in southern Arizona, and to think that the Doctor has forgotten the real name, as he says he has done in the case of the red Longhorn that he found with it? So much unnatural history seems out of place in the pages of a journal like the News, which assumes to be a medium for dissemination of science.

Passing over the use of wrong termination in several cases, since this fault does not wholly obscure the application of the names, we should like to say that the protection afforded the large Buprestidæ like *Gyascutus* and *Hippomelas* by their color is not in any way great—they are easily startled and often fly from their resting places long before one is in reach of them, depending upon their swift flight for safety. Their principal enemies are birds and lizards and the harmony between the beetles and their surroundings (they rest chiefly on the smaller twigs where their bulk alone betrays them), is not close enough to deceive such keen-eyed creatures.

In conclusion, disclaiming any personal knowledge of the classification of the Mantidæ, we wish to ask if the Old World *Mantis religiosa* really awaits the approach of other insects on the deserts of Arizona? and to add that the name "*nina de la tierra*" belongs to the fat sand crickets (*Stenopelmatus*) which lurk in holes scooped out under cover of stone or wood and not to the arboreal Mantids which are locally known as "campomoches."—H. F. WICKHAM.

NOTE ON THE CORUCA, HAEMATOSIPHON INODORA. (Duges), [Hemiptera].—Prof. Herbert Osborn, in his invaluable account of "Insects affecting Domestic Animals" (Bull. U. S. Ent. 5, 1896), has discussed the Bedbugs (pp. 157-63). It must be noted, however, that his figure (90) of "*Acanthia inodora*" is incorrect in two important points; the eyes in this species distinctly touch the pronotum, while Osborn makes

them distant; also led astray by an interrupted impressed line, he has inserted an extra abdominal segment. The first visible (really the second) abdominal tergite is actually very long comparatively, and is sufficiently correctly delineated in the "Biol Centr. Amer. Rhynch. Het. II Pl. 20, f. I." This feature of Osborn's drawing puzzled me considerably at first.

Champion also refers (p. 337) to the "late Dr. A. Dugés." I am happy to state that that distinguished naturalist was still in the land of the living as recently as May 19th, and I trust will continue here till many more Mays are past.

It was to be expected that the old idea that references to "bugs," in 16th or 17th Century literature, referred to *Clinocoris lectularius*, would linger in popular entomological books, but it is somewhat surprising to find it repeated by so erudite a worker as Mr. Marlatt and so recently as 1902, (Circ. 47, U. S. Div. Ent.). There can be little doubt that the word "bug" is a corruption of the Welsh "bwg"—pronounced "bog" (with a slight modification of the vowel—it is to-day pronounced "boog" [as in food] over a large area of England)—which simply means "hobgoblin," in fact "bogie!" and that is obviously the significance it always bears in Shakespeare and contemporary writings; f. ex. "the bug which you will fright me with I seek" (Winter's Tale). The Scottish Gaelic is very similar; some dictionaries give "bugbear" as "bocan," which would mean "a little goat," the proper word is "bochdan," which is probably connected with "bochd," meaning poor or miserable. The Scottish Gaelic word for "Bedbug" is "Miol-fhioda," having nothing whatever to do with the above.

As I am doing a little work at the "Bedbugs," I will be grateful for material in all stages (alcoholic preferably) of *hirundinis*, *columbarius* or *pipistrelli*, also *lectularius* from the Southern States.—G. W. KIRKALDY, Honolulu, T. H.

DURING the summer just closed the University of Kansas carried on more work in research and specimen collecting than ever before in its history. In all about 12,000 specimens were added to the museums. Three parties were sent out. One was in Arizona under Dr. H. F. Snow.

Dr. Snow increased his collection of entomological specimens with 10,000 insects, many being very rare and valuable. Within the last three years Dr. Snow has made six expeditions and added more than 85,000 specimens to his collection, which now has a total of more than 175,000 specimens, embracing bugs and insects from all over the world, and especially the United States. This is the largest collection of its kind connected with any institution of learning in the United States. It has taken Dr. Snow since 1876 to collect this number, and since that year he has personally conducted twenty-two expeditions.

Dr. Snow's company last summer was composed of seven members.

Their headquarters were at Oak Creek Canyon, twenty miles southwest of Flagstaff, Arizona, and twenty miles from any railroad. All provisions were carried on pack horses. The walls of the canyon were 1,500 feet high, and at one time Dr. Snow came near losing his life in one of the canyons. He was collecting specimens one afternoon when suddenly an awful roar attracted his attention. Upon turning around Dr. Snow saw a great bank of water coming down the canyon, rumbling and rolling with great logs and brushwood on its crest. He scrambled up the side of the canyon but the flood was so rapid that it was over his feet before higher ground could be reached.

The specimens collected required seventy-eight boxes for shipping and are classified by Dr. Snow as follows: Lepidoptera, 1,400; Coleoptera, 3,000; Hymenoptera, 3,000; Diptera, 1,750; Hemiptera, 400; Neuroptera, 300, and Orthoptera, 150. In addition to these he secured many excellent specimens of rattlesnakes, centipedes and scorpions.

*TRYPETA SOLIDAGINIS*.—I find that certain authorities state that it is the fly *Trypeta solidaginis* which "escapes from the gall by fretting against the wall which it moistens, its face temporarily swollen into a spongelike mass for that purpose." My own observations, however, have discovered to me the fact that it is the larva, instead of the fly, which provides a passageway to the outer world. Immediately before becoming a pupa, the larva, which at maturity develops a horned process similar to the Cecidomyidæ, by constant friction of this "breast-bone," frets a small tunnel to the surface of the gall, leaving but the merest shell of the epidermis as a protective cap or covering. The larva then retires to the central chamber, leaving in its wake the "sawdust," which is the reduced plant tissues from which has been absorbed all the nutritious substance. This visionary work, I find, usually occurs during the latter part of February or first week in March.

After the larva's return to the central cell, in a single night, in most instances, it transforms into a pupa, not by casting its skin, but simply undergoes a hardening process, and also changing from the cream-white color of the ordinary larva to a golden brown deepening to shining black at the small end. The fly emerges from this case in May or June, when it shall find the new shoots of solidago sufficiently advanced for gall development.

I base my conclusions upon galls which I have opened sufficiently to be able to observe the larva at its work without disturbing its natural methods. As a further experiment, I also removed several larvæ from their galls and placed them on cotton wool in empty walnut shells covered with bits of glass, where I could better observe their method of operating the chitinous process, which was continued as if in natural surroundings. They also developed into pupæ, from which, in due time, there emerged perfect flies, although almost entirely reared under these foreign conditions.—ALBERTA FIELD, Ashtabula, Ohio.

*SPHÆRIDIMUM SCARABÆOIDES* Linn. in Delaware.—In 1898 I recorded (*ENT. NEWS*, vol. ix, p. 172) the occurrence in northern New York of this species in large numbers, the first specimens having been taken in 1896. Since then it has been recorded from central New York by the writer and from southern New York (in the Catskill Mts.) by Mr. R. F. Pearsall (*ENT. NEWS*, vol. xii, pp. 158 and 209). In the minutes of the Newark Ent. Soc. for September 8, 1901 (*ENT. NEWS*, vol. xii, p. 256), it is recorded from the vicinity of Split Rock Pond, Morris Co., N. J.; this being the first record of its occurrence in New Jersey.

The first record of its occurrence in Pennsylvania seems to be that noted by Mr. G. W. Caffrey (*ENT. NEWS*, vol. xii, p. 296), and the locality given is eastern Pennsylvania, near Bethlehem.

In the *NEWS* for 1903 I find three references to the occurrence of this species in New Jersey and Pennsylvania. The first of these is in the minutes of the Newark Ent. Soc. for February 8th (p. 97, vol. xiv), where it is recorded from Chester, Morris Co., N. J., and also from Anglesea. The second reference is to be found in the minutes of the Feldman Collecting Social for May 20th (p. 242), where its occurrence at the Philadelphia neck is noted. The third reference is in the minutes of the Newark Ent. Soc. for September 13th (p. 308), but the locality is not given.

On May 6th last, one of my students collected a single specimen of this species here, and on the 14th, while in the field, I made a search for the species and found it in large numbers in its favorite place, fresh cow-droppings.

It seems hardly probable that a beetle of its size could have been overlooked long in a section of country which has been so thoroughly worked over, entomologically, as southern New York, New Jersey and eastern Pennsylvania, and it is to be inferred, therefore, that the species has been rapidly extending its range southward along the Atlantic seaboard within the past few years.—C. O. HOUGHTON, Newark, Del.

MEETING OF THE OFFICIAL ENTOMOLOGISTS OF THE COTTON BELT.—The official entomologists of the cotton belt met at Jackson, Mississippi, on August 2, 1904, to discuss matters related to the State quarantines that are maintained for the purpose of preventing the introduction of the cotton boll weevil into uninfested regions. Those present were Prof. C. E. Chambliss, of South Carolina; Prof. H. A. Morgan, of Louisiana; Mr. Wilmon Newell, of Georgia; Prof. E. D. Sanderson, of Texas; Mr. Reed, representing Prof. G. W. Herrick, of Mississippi, and Messrs. W. D. Hunter and A. W. Morrill, of the Bureau of Entomology, United States Department of Agriculture. Organization was effected with Prof. Chambliss in the Chair.

The object of the meeting being to formulate a plan for bringing about uniform State quarantine laws and regulations, the subject of the methods of dissemination of the cotton boll weevil was recognized as of much im-

portance in this connection, and was discussed at length. It was generally agreed that the greatest danger of transporting the boll weevil from infested to uninfested points lies in the importation of live insects merely to satisfy curiosity or for experimental purposes, the importation of cotton seed for planting from infested districts, and the importation for milling purposes of baled cotton, particularly such as that which was produced late last season in Texas, by thrashing the unopened bolls. Mr. Newell reported having found a boll weevil in examining a hand-full of cotton batting.

Prof. Morgan outlined the plans of the Louisiana Crop Pest Commission for eradicating isolated colonies when this seemed practical, and for delaying the spread of the weevil when eradication was entirely impractical, by assuming complete control of the ginning of the cotton and of the disposition of the seed.

Resolutions were unanimously adopted, the provisions of which, if embodied in the various State quarantine laws and regulations, were believed to furnish ample protection, and at the same time inconvenience shipping interests only in such respects as to maintain the desired protection. These resolutions contain clauses recommending the maintenance of an absolute quarantine against cotton seed, seed cotton, hulls, seed cotton and cotton seed sacks and corn in the shuck from the infested district, and an absolute quarantine against hay and grain, except during the months of July, August and September.

It was voted that in order to facilitate in the future the transaction of business connected with State boll weevil quarantines, a permanent organization be established among the official entomologists of the cotton States. Messrs. Morgan, Herrick and Hunter were made members of the Executive Committee.—A. W. MORRILL, Secretary.

FIRST MOSQUITO—What! Are you trying a black baby?

SECOND MOSQUITO—Yes, I'm in mourning.—*Life*.

A GREEN CITY GIRL'S BLUNDER.—The young daughter of a prominent New York financier, who had passed most of her years either in the city or at the large summer resorts, recently paid her first visit to a real country home. She was anxious to show that she was not altogether ignorant of rural conditions, and when a dish of honey was set before her on the breakfast table she saw her opportunity.

"Ah," she observed, carelessly, "I see you keep a bee."—*Newspaper*.

THE VISITOR, gushingly.—"What do you do. Analyze insects?"

"Yes."

"Oh, how dreadful! Do you find it interesting?"

"Exceedingly."

"Well, I enjoy teaching nature in her simplest forms, and believe everyone should know a bug from an insect."

## Entomological Literature.

BRITISH LEPIDOPTERA: J. W. Tutt, London.

The fourth volume of this monumental work has just been received and fully maintains the exhaustive standard established by its predecessors, and, without touching on the technical completeness of it, I want to particularly bring it to the attention of our American workers in Entomology; every collector of insects, especially Lepidoptera, in the United States and Canada should have in his library at least one volume, if he cannot have all, of this work. The reason for this very positive statement is, that it *tells one what to do*. We have hundreds of careful, observant, some natural born, collectors in this country, the great majority of whom are far removed from Entomological centers, and are, for the most of their time groping in the dark, and wasting opportunities for making original and very important observations, that may never come their way again, because what they see with so little effort seems of little consequence and not worth the trouble of recording, or even if impressed with a particular item of insect economy pass it by, because of the thought that, of course, some one else knows all about it and has published it somewhere.

In Mr. Tutt's work all of the observations of every independent observer are gathered together about each particular species, going into the most minute detail with regard to every phase of its life and habits, points that alone are seemingly insignificant are being placed side by side with others, and together help to make each other clear, to all of which are added his illuminating summarizations and comprehensive treatment of the whole.

Even a few chapters carefully read in any one of the volumes will forcibly impress on the mind of the collector or student alike the importance and necessity of careful, ceaseless and never satisfied desire to add to the knowledge of his favorite pastime or pursuit, and, most important, he will be made to clearly understand what are the really valuable things to observe, and how and when to look for them. As complete as this work is, Mr. Tutt throughout calls attention to the gaps in our knowledge, probably none of them very difficult to work out, and some of them, no doubt, observed by many collectors, but from carelessness or thoughtlessness never recorded in print, where they would be available to the Systematist; these suggestions alone are enough to awaken the desire to be up and doing and I can confidently say that a copy of this work placed in the hands of every American collector will double the pages in all of our Entomological Magazines in the course of a few years, and do more to promote an abiding interest than any other book that has ever been written on the subject.

W. S. KEARFOTT.



## Doings of Societies.

Minutes of meetings of Brooklyn Entomological Society, held at the residence of Mr. Geo. Franck, 1040 DeKalb Ave., Brooklyn, N. Y.

*March 5, 1903.*—Twenty-one persons present, the President in the chair. Discussion as to the correctness of Dr. T. W. Harris' statement in "Insects Injurious to Vegetation," that the larvæ of *Darapsa myron* bite off the stems of grapes through stupidity or disappointment. Messrs. Doll and Franck had never observed this habit in any of the hundreds of larvæ bred by them. Mr. Pearsall suggested that possibly, as the larvæ approached maturity they required the more substantial nourishment which the woody stems provided. Mr. Weeks had had larvæ which, on failure of supply of fresh leaves, would nibble at the stems or even gnaw unripe grapes, and suggested that it was due to an intelligent purpose, as the stimulation of the growth of the vine and foliage by the pruning of the fruit. Professor Smith cited Professor Lintner's statement that the larvæ of *N. leucostigma* had been observed, at Albany, N. Y., gnawing off tender stems bearing leaf clusters. This was not a common practice, and there was no explanation of the cause. Dr. Zabriskie and Prof. Smith had each observed a larva, possibly a Rhynchophorid, boring in the petioles of maple leaves, with the result that they fell prematurely.

Prof. Smith further stated that in his investigations into the life history of certain mosquitoes he had found the eggs hatching and larvæ active in water covered with ice, and that few persons realized how active insects were during the winter months, many rare species being available for capture early in that season.

*April 2, 1903.*—Twenty-one persons present, the Vice-President in the chair. Mr. J. R. de la Torre Bueno was elected member.

Mr. Weeks read a paper upon "Theory of the Origin and Evolution Productive of the Brilliant colored Bands upon the Secondaries of Moths of the genus *Catocala*," in which the

bands first originated as a means of protective resemblance and performed the same office as the striped primaries of many arctians by counterfeiting the alternate lights and shadows of plant stems or masses of dead vegetation. In the course of natural development these bands became too prominent to be longer available for concealment and thereupon served in a directly contrary capacity, viz., to attract the attention of an enemy and thus divert attack from the less showy but more vital parts. In the course of natural selection moths possessing the brightest hued secondaries would survive and thus the character would be still, further encouraged and improved. The practice of the members of this genus of boldly exposing the secondaries at night, while engaged in feeding, would seem to substantiate this theory. Whenever a formation, coloration, or maculation rendered the owner conspicuous for the purpose of directing attack it might be classed as active or aggressive, but where such characteristics served merely for concealment they might be termed passive or negative.

Discussion by the Society. Mr. Doll remembered seeing a *Catocala* in which the primaries were tinged with the red hue of the secondaries, and Mr. Franck another in which the secondaries were black or red according to the direction of view.

May 7, 1903.—Eighteen persons present, Mr. Richard F. Pearsall in the chair. Mr. Hulst Mead was elected a member.

Dr. Call lectured upon the "Geological Preservation of Insects and the March of Insect Life upon the Earth." Insects undoubtedly originated from the crustaceans. The indestructibility, under favorable conditions, of chitin, of which insects as well as crustaceans are largely composed, had tended to preserve forms which existed probably millions of years ago, and these were now found in the Swedish rocks of the Cambrian Age and in the Lower Silurian in this country. In addition perfect insects were often found imbedded in amber.

Dr. Call exhibited specimens of amber containing among others a fly, wasp, spider, and cockroach. Their presence was explainable on the theory that having come in contact with the sticky surface of this material while fresh they had

been unable to extricate themselves and were afterwards completely submerged by additional exudations.

June 4, 1903.—Sixteen persons present, Mr. Richard F. Pearsall in the chair.

Mr. W. W. Hoover, Economic Entomologist, of Prospect Park, Brooklyn, was elected a member.

Mr. Franck read a letter from Mr. Carl Schaeffer descriptive of the experiences in collecting of Mr. Doll and himself at Brownsville, Texas.

Mr. Wasmuth exhibited some fine variations of *Pachnobia manifesta*, *Arctia rectilinea*, *Arctia arge* (the latter extremely suffused secondaries) and some nearly natural larvæ of *Atacus calleta*, bred by himself from the egg.

Mr. Franck presented a series of *Hepialus* comprising specimens greatly varying in size of what had heretofore been identified as several distinct species, but which evidently constituted but one. Also some specimens of *Cychnus tuberculatus* from British Columbia.

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The October meeting of the Newark Entomological Society was held on the 9th at 3 P.M., with President Keller in the chair and 21 members present. Visitors were: Messrs. Franck, Engelhard, Martin, Wasmuth and Landrack, all of the Brooklyn Society.

The congratulations of the members were extended to Prof. Smith for having received the first prize at the St. Louis Exposition for his collection of mosquitos.

Messrs. William Reinecker, of Jersey City, and William Wasmuth, of Brooklyn, were proposed and unanimously elected to membership.

Mr. Broadwell took several pictures of the assemblage.\*

After that a supper was served in the Turn Hall's large meeting room to which thirty-one sat down; the music for the first part of the evening was furnished by Prof. Weidt and five of his friends, and by Prof. Wormsbacher the rest of the evening. Toasts were proposed for the Newark Entomological Society, the Brooklyn Society, etc.

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\* See Plate XVIII.

Professor Smith made the speech of the evening on "Our Twentieth Birthday," in which he gave the history of the Society in every particular, referring to Messrs. Simon Seib, the Society's first President and Julius Bunsow, its first Secretary, both of them members to this day; he also spoke of the Society's ups and downs and the good standing of it at the present time with thirty and some odd members, most of them active, enthusiastic collectors, and new ones added at nearly every meeting.

Mr. Engelhard gave a very interesting account of his and Mr. Doll's collecting trips to Utah last summer.

Other speeches, recitals and songs were brought up and an all around good humor prevailed until the termination at 11 P. M.

OTTO BUCHHOLZ, *Secretary.*

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A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held September 22d. Mr. Philip Laurent, Director, presided. Nineteen persons were present. Mr. Laurent presented a blown larva of *Eacles imperialis* and Mr. H. W. Wenzel two specimens of *Hydrobius tessellatus*. The latter were taken at Atco, N. J. IX. 11.04.

Mr. J. Chester Bradley spoke on the position in the classification of the Hymeroptera of certain anomalous genera. The position of the genus *Ropronia* was set forth in detail, and its comparative anatomy explained by blackboard diagrams.

Dr. Calvert exhibited a number of wheat grains numerously infested with *Calandra oryzae*; also specimens of *Cordulegaster maculatus*, *C. diastatops* and *Libellula quadrimaculata*, from Poyntelle, Wayne County, Penna., June, 1904, being the first records of those species in Eastern Pennsylvania. The two cordulegasters were taken along the same brook, *C. diastatops* in the open meadow, *C. maculatus* in the woods; a correlation between the different amounts of light in the two localities and the size of the eyes (larger in *maculatus*) was suggested. The ♀ *C. diastatops* was observed to make the same motions of oviposition as seen in the Libellulinæ and Gomphinæ, by striking the water of the brook repeatedly with

the tip of the abdomen; the eggs, however, were not seen. The speaker had, near the above-mentioned locality, on June 30, 1904, observed at short range, but not taken, a single individual of what was in all probability the tropical *Anax longipes*.

Mr. E. Daecke spoke of the comparative rarity of *Soma-tochlora provocans* previous to the present year when he had seen the species in some abundance. He took *Heterina americana* at Bamber, N. J.; also *Cirrhophanus triangulifer*, a Noctuid, at Fort Lee, N. J.; *Neonympha areolatus* at Tom's River and Brownsville Junction, N. J., June 27th and July 12th; *Hagenius brevistylus* on the Great Egg Harbor River.

Mr. Ilg exhibited some interesting blown larvæ of Lepidoptera.

Mr. Rehn exhibited a *Conocephalus* taken in the Philadelphia Neck. It was collected by Mr. Wenzel, who thought it the species *atlanticus*, but it proved to be *palustris*. Another species was shown, taken at Tinicum on September 9th. It was described by Blatchley under the name *C. bruneri*.

Mr. Wenzel presented the specimen of *palustris* and said it was taken September 21st.

Mr. Bradley exhibited an Evaniid taken by Mr. Stone in the city limits. It is an undescribed species.

Mr. Greene said he and Mr. H. A. Wenzel had captured a number of *Adrane coecus* at Lehigh Gap, Penna. Mr. H. W. Wenzel said he would report later on his recent catch of water beetles and exhibit the specimens. He found many pupæ at the seashore buried in the dry sand apparently awaiting a rain before emerging. Mr. Laurent said he had two Pennsylvania specimens of *Cirrhophanus triangulifer*. Mr. E. T. Cresson, Jr., was elected an associate of the Section.

HENRY SKINNER,

Secretary.

At the meeting of the Feldman Collecting Social held on September 21 at the residence of Mr. H. W. Wenzel, 1523 South Thirteenth Street, Philadelphia, twelve persons were present.

Mr. Harbeck reported *Cicindela lepida* at Clementon, N. J., July 4th.

Mr. Boerner recorded *Hydrophorus spurius* at Neshaminy Falls, Pa., July 3d; also *Psephenus lecontei* at same place and date.

Mr. Daecke exhibited *Aedes smithii*, which was found commonly in pitcher-plants at Tuckerton, N. J. He also showed specimens of other orders of insects, including the gall of *Eurosta solidaginis* from which he had reared the flies.

Mr. Wenzel showed specimens of *Hydrocanthus puncticollis* from Cape May Court House, and *Hydrobius tessellatus*, from Atco, N. J., both rare species and new to the State. Also a season's collecting of Haliplidæ from New Jersey and Pennsylvania representing all the local species. *Pterostichus mæstus* as shown by a series from Lehigh Gap, Penna., is unusually large and probably represents a local race. Mr. Daecke reported the capture of *Cicindela rugifrons* and *Donacia floridæ* at Bamber, N. J., September 9.

Mr. Haimbach reported that he had taken between 300 and 400 species of micro-lepidoptera on Five Mile Beach, N. J., during the past summer.

Mr. Haimbach invited the Social to meet at his home in October.

Mr. Wenzel recounted some collecting experiences during the past season. Many water-beetles in the pupae and immature imago stages were found abundantly around the roots of grass tufts in situations which had previously been covered by water but were then almost dry.

WILLIAM J. FOX,  
Secretary.

Minutes of meetings of Brooklyn Entomological Society, held at the residence of Mr. George Franck, 1040 DeKalb Ave., Brooklyn, N. Y.

October 1, 1903.—Seventeen persons present, the President in the chair. Prof. Smith mentioned the occurrence in great numbers, at New Brunswick, N. J., of a species of May fly

during a moist warm evening in mid-summer. The swarm consisted almost entirely of ♀ ♀, and next morning the ground was covered with the dead insects which had extruded the contents of their ovaries. The abdomen had two vaginal openings and a large egg mass had been extruded through each. Each mass contained by estimation some 5-6000 eggs.

Mr. Franck stated that at Altoona, Penna., similar insects occurred in such numbers as to form a layer many inches in depth and prevented the running of railroad trains.

Mr. Schaeffer found these flies so numerous at night at Brownsville as to exclude other insects from the lights.

Messrs. Doll and Schaeffer spoke of the rapid succession of insect broods noticed by them in Texas. Although there were comparatively few species of Lepidoptera a new generation appeared each month.

Professor Smith mentioned an experience with mosquitoes at Atlantic City, N. J. While occupying a room on an upper hotel floor he observed that no mosquitoes entered through the open windows, but did enter through the transom when that was left open. He also found the insects on a cafe ceiling below, in large numbers. On investigation he discovered that the hotel was constructed on piles, and that beneath the building was a pool in which the mosquitoes bred and flew upward through the elevator shaft. He had also found mosquito larvæ numerous in sewage drains in Central Park.

The death of Mr. A. Radcliffe Grote having been announced, Mr. Graef and Dr. Call were appointed a committee to prepare suitable resolutions thereupon.

*November 5, 1903.*—Twenty-three persons present, the President in the chair. Messrs. Engelhardt and Call were appointed a committee to prepare a suitable acknowledgement to Mrs. Franck for her share in the entertainment of the Society.

Dr. Zabriskie exhibited a hinged double case of his own invention for the preservation and exhibition of galls. One lid was slightly rabbeted in the other and kept closed by two hooks, the label pasted on the back is cut in two to facilitate the opening of the case. Six cards were laid in each side filling the entire surface with the exception of a half-inch space

running through the center in which was fitted a retaining bar with rabbeted edges lapping over the interior edges of the cards and holding them in place while the bar itself was adjusted and fastened by fitting one end in a slot and the other end by a thumb-spring which permitted the bar to pass below it and then resumed its normal position. The outer and exterior edges of the cards were inserted and held in place under a thin strip on cleat tacked along the sides at a sufficient distance from the bottom of the case to permit the ready insertion of the cards.

The specimens were glued upon cards upon which any descriptive notes could be written. The boxes exhibited were about 9 inches square by  $2\frac{1}{2}$  inches deep and specimens of nearly the aggregate depth of the top and bottom could be accommodated by placing them opposite smaller ones.

Mr. Weeks read a communication which appeared in the New York *Evening Telegram* of September 4, 1903, entitled "At Last a Caterpillar for the Ailanthus Tree," by which it appeared that the writer had for the first time recently seen the larvæ of *Philosamia cynthia* in New York City, and Mr. Week's reply thereto narrating the introduction of the moth in this locality many years ago through the agency of the late John Akhurst of Brooklyn.

*December 3, 1903.*—Seventeen persons present, the President in the chair. Mr. Engelhardt read an account of his trip through the southern part of Virginia during August with a single companion. Starting at Norfolk he visited Richmond, the Natural Bridge, the Peaks of Otter and Apple Orchard Mountains in the Blue Ridge, returning to Norfolk from Bedford City by train. Although collecting was not the object of his trip, he, nevertheless, secured many specimens embracing all orders, some of which he exhibited and which proved of much interest as showing to what extent the insect faunas of New York, New Jersey and Virginia were identical. More than two-thirds of the species are recorded within fifty miles of New York City, in varying degrees of rarity.

ARCHIBALD C. WEEKS,  
*Secretary.*



# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

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## Copulation and Ovulation in *Anabrus Simplex* Hald.

By C. P. GILLETTE.

The so-called Mormon cricket, *Anabrus simplex*, appeared in great numbers in portions of Routt County, Colorado, the past summer. While studying the habits of this wingless grasshopper, near Eddy, my attention was attracted by the large white masses of a jelly-like material that were attached to the abdomens of the females just beneath the ovipositors. They had also been noticed by the ranchmen who spoke of them as "white sacs" and "blubber." I concluded the phenomenon must be associated in some way with the process of fertilization and began an investigation. By pinching the abdomens of several females having the white masses attached I found they could be removed without breaking or tearing any organ and that they were held in place by the vulva which grasped a small portion or lobe. Several examples of both sexes were then taken at random from the swarm and their abdomens were opened in search of this body but it was not found. I noticed, however, that the seminiferous tubules of the males were filled with a milky white fluid before copula-

tion, and that after copulation they were empty and yellow in color. A male and female *in copula* were then separated, just before the close of the process and before the sperm mass had made its appearance. The male abdomen was then pinched so as to crowd the contents towards the end, and a sperm mass, exactly like those taken from females, was obtained. I therefore concluded that during copulation the males fill these sacs with seminal fluid and then transfer them bodily to the females who seize them by two of the small lobes, Fig. 1 C and D. The females carry these conspicuous white objects about for a time, extracting a portion, at least, of their contents for the fertilization of the ova.

It was noticed that the females bearing these seminal sacs were most numerous about 9 or 10 o'clock in the morning, and that few or none could be found after 1 or 2 in the afternoon.

Mr. W. W. Miles, postmaster at Eddy, told me he and Mrs. Miles noticed these white sacs attached to the females in great numbers on their ranch during the forenoon of June 27th. Mr. Miles also noticed the females depositing eggs July 5th.

While passing through a large swarm of the hoppers at 9 o'clock in the morning of July 29th, it was noticed that fully half of the females were carrying about these sacs, and the males everywhere were noisy with their stridulations. Whether copulation takes place more than once during the egg-laying period of a female, I have been unable to determine with certainty.

Numerous females bearing the sperm sacs were dissected and in all cases there were many eggs present in the ovaries, some with dark firm shells, apparently ready to be deposited, and others soft and yellow and in all stages of maturity from those less than half-grown to those of full size.

There was no indication that the eggs were developing in sets or broods, for they seemed to grade through all stages from those that were small and just developing to those fully mature. Counts made at Eddy on July 27th gave from 10 to 35 apparently mature eggs, and from 34 to 46 immature eggs in ovaries of single females taken with the sperm sacs attached.

As females taken from this swarm a few days previous had, in several cases, over 100 eggs, in one case 133, and as Mr. W. W. Miles saw so many of the sperm sacs attached to the females of the same swarm on June 27th, and as I again saw them so abundant in a neighboring swarm on July 29th, it seems probable that copulation takes place more than once, particularly as the individuals in a swarm develop very closely together. As nearly as could be ascertained, the swarm at Eddy had all been adults since June 25th, and probably for several days prior to that time.

The manner of ovipositing is to bring the tip of the ovipositor well forward beneath the abdomen and insert it in a nearly perpendicular position. Hill sides and hill tops, where the vegetation is scanty and where the bushes are small, seemed to be the favorite places for egg-laying. A clay or adobe soil with many small cracks in the thin surface crust where the ovipositor could be easily inserted was especially used for egg-laying.

The sperm sac measures from 10 to 12 millimeters in diameter when first obtained from the male, and it all appears to view during the last few seconds of the copulatory act. As soon as it appears to view the female begins to run about, dragging the male upon his back behind her until, catching upon some object, he is pulled loose.

The sac, when first received, is suggestive of the brain of a higher vertebrate in form, there being two large lobes corresponding to the cerebral hemispheres and beneath these four smaller lobes corresponding to the quadrigemina somewhat enlarged. The upper pair of these little lobes are somewhat smaller than the others and are pale yellowish in color resembling cartilage. The larger pair are milk-white in color at first, even whiter than the hemispheres, and it is these that are clasped by the vulva of the female. At D of the accompanying plate the two large hemispheres and the two milk-white lobes are all that show, the other pair of lobes being hidden behind the small pair shown.

After being held in the vulva of the female for a short time the small milk-white lobes become gradually translucent and

yellowish in color like the other small pair. For a time there is an opaque white globule at the center of each lobe which gradually diminishes in size, until they are entirely cartilaginous in appearance.

These small lobes are all quite firm to the touch while the two very large ones are soft and easily crushed and torn as the female crawls about.

After two or three hours these masses disappear entirely, but whether the contents are largely taken in by the female or whether she rejects the greater portion after extracting the spermatozoa, I did not determine.

Copulation\* began soon after sunrise and continued until near noon in the swarms I visited. I did not witness the beginning of the copulatory process, but in no case did a pair remain in *coitu* more than ten minutes after I noticed them. After about 10 in the morning the chirping of the males almost entirely ceased, except as they were disturbed by some moving object, and then the squeaking noise which they make seemed to be entirely a note of warning, and would cause the members of the swarm to run or jump in all directions for a distance of 20 or 30 feet, and sometimes farther, as if frightened.

The position of the male during copulation was, either curled beneath the female—literally standing on his head—or lying upon his back beneath her and being dragged behind her if she chose to walk about.

#### EXPLANATION OF PLATE XIX.

*Anabrus simplex* Hald.—A, adult female; B, a comparatively straight ovipositor; C, sperm mass clasped by vulva of female; D, the sperm mass removed immediately after copulation showing the two small lobes which are seized by the vulva of the female; E, end of male abdomen from above showing clasping organs; F, wings of adult male; G, a cluster of eggs, the upper one coming to the surface. All natural size except E and F, which are twice natural size.

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\* I am under obligations to Mr. C. L. Marlatt, Acting Chief of the Bureau of Entomology, for having a search made in the library of the Bureau for published observations upon copulation in this genus of Orthoptera. The librarian, Mr. Nathan Banks, found nothing upon the subject. The writer knows of no such observations except those here recorded.

## Notes and Records of New Jersey Orthoptera.

BY JAMES A. G. REHN.

The following records have been made almost entirely from material studied during the past year. Although New Jersey, entomologically considered, has been examined more closely than any other Middle Atlantic state, the localities given in this paper may assist in mapping with greater accuracy the distribution of the insects of this order within the State, when taken in conjunction with the great number of published records. The enormous influence of environment is no better illustrated than by the distribution of certain species of Orthoptera found in the cedar swamps, while the apparent preference of other species for the absolutely dry pine barrens is quite as remarkable.

The author has spent considerable time in the wilder and more unfrequented sections of south and central New Jersey, a portion of which at least is very thinly settled—a land which formerly was the centre of a thriving iron industry but now almost deserted. In some of the more inaccessible portions of Ocean and Burlington Counties the cedar swamps and pine lands are absolutely primæval for miles, a condition, the average individual would not expect to find in a state so long settled as New Jersey. As many specimens have been collected miles away from any town or named stream I have been compelled to designate them as taken between *such* and *such* points.

The principal localities mentioned in the following pages are here listed to prevent needless repetition of county names:

Boonton, Morris Co., Riverton, Burlington Co., Medford, Burlington Co., Taunton, Burlington Co., Atsion, Burlington Co., Bear Swamp, Burlington Co., between Cedar Grove and Chatsworth, Burlington Co., Whitings, Ocean Co., near West Creek, Ocean Co., Stafford's Forge, Ocean Co., Clementon, Camden Co., Atco, Camden Co., Da Costa, Atlantic Co., Westville, Gloucester Co., North Woodbury, Gloucester Co., Cape May, Cape May Co., Anglesea, Cape May Co.

### BLATTIDÆ.

***Ischnoptera uhleriana*** Saussure (= ***unicolor*** Scudder).

Peermont, Cape May Co., July 13, 1901 (Rehn). [♂].  
Atsion, Oct. 8, 1903 (Hebard). [♀.]

## ACRIDIDÆ.

**Nomotettix cristatus** (Scudder).

Atsion, Oct. 8, 1903 (Hebard).

**Acrydium obscurum** (Hancock).

"N. J." (Academy coll.).

The separation of *obscurum*, *arenosum* and *gibbosum* is a task which is practically hopeless. The extremely slight differentiation of these "species" is by no means sufficient to entitle them to full specific rank. There is, of course, some evidence in favor of regarding *obscurum* as a geographic race of *arenosum*, but there appears to be no question but that *gibbosum* is inseparable from *obscurum*. Blatchley (Orth. of Indiana, p. 225) has presented his views on the case, and my experience with all available material has been the same.

**Paratettix cucullatus** (Burmeister).

Boonton, January 10, 1901 (G. M. Greene).

**Tettigidea parvipennis** (Harris).

Atsion, Oct. 8, 1903 (Hebard). Ortle, Ocean Co., May 16, 1903 (Viereck). Ocean City, Cape May Co., April 19, 1903 (Viereck).

**Tettigidea lateralis** (Say).

Cape May, June 4, 1903 (Viereck).

It is rather interesting that the extreme southern point of New Jersey should be the home of true *lateralis*, while its northern congener *parvipennis* should reach as far south as Ocean City. It is quite likely that the two forms overlap or intergrade along the coast of southern New Jersey, but at all events the Cape May specimens are typical *lateralis*.

**Tettigidea armata** Morse form **depressa** Morse.

"N. J." (Academy coll.).

**Truxalis brevicornis** (Johannson).

Near West Creek, Sept. 6, 1903 (Rehn). Not common, taken in tidal marsh.

***Syrnula admirabilis*** (Uhler).

Stafford's Forge, Sept. 6, 1903 (Rehn). Near West Creek, Sept. 6, 1903 (Rehn). Atsion, Oct. 8, 1903 (Hebard). Cape May, Sept. 21, 1903 (Daecke).

At Stafford's Forge and in the vicinity of West Creek this species was fairly common on several stretches of white sand covered with the remains of cut scrub oak. At Atsion Mr. Hebard found the species well represented, six specimens being taken, of which four were males.

***Orphulella pelidna*** (Burmeister).

Stafford's Forge, Sept. 6, 1903 (Rehn). Near West Creek, Sept. 6, 1903 (Rehn). Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn). Atsion, Oct. 8, 1903 (Hebard). Cape May, Aug. 7, 1903 (Viereck).

***Dichromorpha viridis*** (Scudder).

Boonton, Aug. 22, 1901 (G. M. Greene). Bear Swamp, Aug. 13, 1902 (Rehn). Atsion, Oct. 8, 1903 (Hebard).

***Glinocephalus elegans*** Morse.

Near West Creek, Sept. 6, 1903 (Rehn). Cape May, July 28, 1903 (Viereck) [immature].

***Chorthippus curtipennis*** (Harris).

Angelsea, Cape May Co., Sept. 4.

***Arphia sulphurea*** (Fabricius).

Westville, May 1 (Rehn). Da Costa, July 5, 1903 (Daecke). West Plains, Burling. Co., June 21, 1901 (Rehn).

***Arphia anthoptera*** (Burm).

Near West Creek, Sept. 6, 1903 (Rehn). Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn). Whitings, Sept. 5, 1903 (Rehn). Atsion, Oct. 8, 1903 (Hebard). Atco, Oct. 14. Medford, Sept. 7, 1902 (Stone). Riverton, Aug. 3, 1899 (Rehn).

***Chorthopaga viridifasciata*** (De Geer).

Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn). Atsion, Oct. 8, 1903 (Hebard) [adult and nymph]. Bear Swamp, Nov. 1, 1903 (Rehn) [nymph].

**Spharagemon bolli** (Scudder).

Between Cedar Grove and Chatworth, Sept. 7, 1903 (Rehn). Atsion, Oct. 8, 1903 (Hebard), Sept. 2, 1901 (Rehn). Almonesson, Gloucester Co., Sept. 18.

**Spharagemon collare wyomingianum** (Thomas).

Atsion, Oct. 8, 1903 (Hebard), Sept. 2, 1901 (Rehn), Da Costa, July 19 (Skinner).

**Scirtetica marmorata** (Harris).

Stafford's Forge, Sept. 6, 1903 (Rehn). Near West Creek, Sept. 6, 1903 (Rehn). Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn). Whitings, Sept. 5, 1903 (Rehn), Atsion, Oct. 8, 1903 (Hebard). Lucaston, August 10, 1903 (Daecke).

This is one of the most characteristic species of Acrididæ found in the dry portions of the "barrens."

**Psinidia fenestralis** (Serville).

Riverton, Sept. 2, 1900 (G. M. Greene), Sept. 8, 1901 (Viereck). Westville, Aug. 19, 1897 (Rehn).

**Schistocerca alutacea** (Harris).

Near West Church, Sept. 6, 1903 (Rehn). Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn). Stafford's Forge, Sept. 6, 1903 (Rehn). Whitings, Sept. 5, 1903 (Rehn). Atsion, Oct. 8, 1903 (Hebard).

**Melanoplus scudderi** (Uhler).

Atsion, Oct. 8, 1903 (Hebard). Apparently common, as Mr. Hebard secured ten specimens in a comparative short time.

**Melanoplus fasciatus** (Walker).

Whitings, Sept. 5, 1903 (Rehn). Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn).

**Melanoplus atlanis** (Riley)

Bear Swamp, Nov. 1, 1903 (Rehn). Riverton, Aug. 11, 1901 (Viereck). Atco, Oct. 14. North Woodbury, Gloucester Co., Aug. 11, 1901 (Viereck). Big Timber Creek, Camden-Gloucester Co's, Sept. 22, 1901 (Viereck). Atsion, Oct. 8, 1903 (Hebard).



**Melanoplus impudicus** Scudder.

Between Harris and White Horse, Aug. 13, 1902 (Rehn). Atsion, Sept. 2, 1901 (Rehn) and Oct. 8, 1903 (Hebard).

This species has never before been recorded on the Atlantic north of Georgia, from which State and Mississippi Scudder described it. Prof. A. P. Morse has very kindly examined several New Jersey specimens and pronounced them *impudicus*. The Academy collection contains a male specimen taken at Chickamauga, Walker Co., Georgia, June 24, 1898 (Viereck).

**Melanoplus femur-rubrum** (De Geer).

Near West Creek, Sept. 6, 1903 (Rehn). Stafford's Forge, Sept. 6, 1903 (Rehn). Atsion, Oct. 8, 1903 (Hebard).

This common and widely distributed species appears to be absent from the true barrens, but any small cultivated clearing though surrounded entirely by heavy timber, will contain its colony of *femur-rubrum*.

**Melanoplus luridus** (Dodge).

Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn). Whitings, Sept. 5, 1903 (Rehn).

After examining the material in hand I heartily endorse Blatchley's recent work in synonymizing *M. collinus* with this species (Orth. of Ind., p. 325), on evidence supplied by Morse after examining the material in the Scudder collection.

**Melanoplus femoratus** (Burmeister).

Atsion, Oct., 8, 1903 (Hebard). Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn). Near West Creek, Sept. 6, 1903 (Rehn).

**Paroxya scudderi** Blatchley.

Atsion, Oct. 8, 1903 (Hebard). Speedwell, Aug. 12, 1902 (Rehn). Bear Swamp, Aug. 13, 1903 (Rehn).

A series of nine specimens from New Jersey appear to be identical with authentic specimens (♂ and ♀) kindly furnished by Prof. Blatchley. This form is in New Jersey a cold bog species, and at Bear Swamp was taken together with *P. florida*, which is explained by the location of the Swamp at the extreme western edge of the cedar swamp and bog region,

and also by the fact that it is somewhat tinged with the fauna of the Delaware Valley, a region in which *floridiana* is moderately common. The coast region seems to be frequented by *floridiana* alone, several specimens of which were taken near West Creek, Sept. 6, 1903 (Rehn). The record of *floridiana* from Speedwell (ENT. NEWS, xiii, p. 316) is erroneous, as only *scudderi* was taken there. The color of *scudderi* as exhibited by the New Jersey specimens is very dark and with but little color contrast.

These records carry the range of the species east of the Alleghanies, west of which it was known only from Indiana.

#### TETTIGONIDÆ.

##### **Scudderia furcata** Brunner.

Near West Creek, Sept. 6, 1903 (Rehn). Riverton, Sept. 8, 1901 (Viereck).

##### **Scudderia texensis** Saussure and Pictet.

Atsion, Oct. 8, 1903 (Hebard). Between Cedar Grove and Chatsworth, Sept. 7, 1904 (Rehn).

##### **Scudderia curvicauda** (De Geer).

Riverton, Aug. 11, 1901 (Viereck).

##### **Amblycorypha uhleri** Stal.

Atsion, Oct. 8, 1903 (Hebard).

##### **Gonocephalus atlanticus** Bruner.

Atsion, Oct. 8, 1903 (Hebard). These specimens (2) have been compared with paratypes.

##### **Orchelimum vulgare** Harris.

Near West Creek, Sept. 6, 1903 (Rehn). Atsion, Oct. 8, 1903 (Hebard).

##### **Xiphidion brevipenne** Scudder.

Near West Creek, Sept. 6, 1903 (Rehn). Taunton, Sept. 6, 1902 (Stone). Medford, Sept. 7, 1902 (Stone). Atsion, Oct. 8, 1903 (Hebard). Cape May, Aug. 1, 7 and 23, 1903 (Viereck). Riverton, Sept. 8, 1901 (Viereck). Atlantic City, Sept. 11, 1902 (Rehn).

The Atlantic City specimens have been recorded as *X. nemo-*

*ræle* (ENT. NEWS, xiii, p. 315) and the Riverton individuals as *X. saltans*.

**Xiphidion fasciatum** (De Geer).

Atsion, Oct. 8, 1903 (Hebard). Taunton, Sept. 6, 1902 (Stone). Medford, Sept. 5, 1902 (Stone). Near West Creek, Sept. 6, 1903 (Rehn).

**Xiphidion saltans** Scudder.

Atsion, Oct. 8, 1903 (Hebard).

These specimens agree very well with the descriptions of *saltans*, except for the fact that the body measurements of the female are slightly larger, while the ovipositor is about one and a half mm. shorter. The structure of the male cerci and the coloration fully agree with the figures and descriptions.

**Xiphidion strictum** Scudder.

Atsion, Oct. 8, 1903 (Hebard). Both forms of the species and both sexes of each other are represented in the series from this locality. The cerci of the male of the long-winged type are somewhat different from those found in the short-winged male, which is typical when compared with determined Nebraska material.

### GRYLLIDÆ.

**Tridactylus terminalis** Scudder.

Lavallette, Ocean Co., May 20, 1903 (Viereck).

**Nemobius fasciatus** (De Geer).

Medford, Sept. 7, 1902 (Stone). Atsion, Oct. 8, 1903 (Hebard).

**Nemobius carolinus** Scudder.

Atsion, Oct. 8, 1903 (Hebard). Near West Creek, Sept. 6, 1903 (Rehn).

**Gryllus luctuosus** Serville.

Atsion, Oct. 8, 1903 (Hebard). Riverton, Sept. 10, 1899.

One female in the Atsion series (9) might be mistaken for *G. firmus*, as it is of extremely large size, but all the structural characters are those of *luctuosus*, except the number of tibial spurs which appears to be of little or no taxonomic value.

***Gryllus pennsylvanicus*** Burmeister.

Near West Creek, Sept. 6, 1903 (Rehn). Between Chairville and head of Batsto River, Burlington Co., June 17, 1901 (Rehn).

***Cæcanthus angustipennis*** Fitch.

Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn). Clementon, Aug. 13, 1899 (Viereck).

***Cæcanthus quadripunctatus*** Beutenmüller.

Westville, Aug. 31, 1899 (Viereck).

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### Description of Two New Species of *Culex*.

By JOHN A. GROSSBECK, Paterson, N. J.

***Culex pretans*** sp. nov.

♀.—Head brown, occiput almost covered with pale yellow scales, some of which collect in a distinct border to the eyes, and with a small patch of dark brown scales on each side; antennæ dark brown, the basal two joints pale testaceous; proboscis and palpi dark brown, the terminal joint of the latter almost obsolete. Mesonotum brown with numerous yellowish scales and a usually well defined, broad median vitta of brown scales, which does not quite reach the anterior margin and is slightly constricted centrally; there are two other patches of scales of the same color, about one-third the length of the thorax, at the base of this vitta, separated from it by a narrow line of yellow scales; scutellum brown, with many yellowish bristles; metanotum evenly dark brown; pleura dark brown, with patches of pure white scales; halteres yellowish white, brown at the apex. Abdomen brownish black, the segments with narrow whitish basal bands, which become wide at the sides; beneath it is clothed with dirty white scales, mixed with some brown ones near the apical margin of the segments. The bands are usually clearly defined, and though narrow, are rarely obsolete. Legs with coxæ yellowish; femora brown above, creamy white beneath, and with a dot of the same color at the knee; tibiæ dark brown above, yellowish beneath; tarsi wholly brownish black; claws uniserrated on all feet; wings hyaline, petiole of first submarginal cell about half as long as this cell. Length 5 mm.

Described from fifteen females, one of which, with a male, was bred from larvæ.

Habitat: Chester, Trenton, Lake Hopatcong and Great Piece Meadows—all in New Jersey.

Types: in the collection of the New Jersey Experiment Station.

The only male was dissected; in color it does not differ from the female, but the thoracic stripe is slightly diffused and the abdominal banding is broader and less defined. The palpi are uniformly brown; the claws of the anterior and mid feet unequal, the larger biserrated, the smaller uniserrated, while the posterior ones are equal and uniserrated. Petiole of first submarginal cell not quite the length of this cell. Length 5.3 mm.

**Culex inconspicuus** sp. nov.

♀.—Head dark brown, occiput with pale yellow scales scattered over the surface; antennæ dark brown, the two basal joints pale testaceous; proboscis and palpi dark brown. Mesonotum dark brown with yellowish scales at the sides, forming a rather diffuse central brown vitta; shoulders brown, separated from the vitta by a narrow line of yellow scales; scutellum brown with yellow bristles; metanotum blackish brown; pleura brown, with small patches of grayish white scales; halteres pale brown, darker at the apex. Abdomen deep brown, with narrow dirty white bands at base of segments, which widen out laterally; beneath it is pale brownish with scattered white scales, more so apically. Legs with coxæ pale brown, femora brown, under side yellowish white, knee dot barely discernible; tibia and tarsi wholly brown; claws uniserrated on all feet; wings hyaline, petiole of first submarginal cell about one-third as long as this cell. Length 4 mm.

♂.—Palpi uniformly dark brown. Bands of abdomen narrow in the anterior segments, very wide in the posterior ones and with some mixed brown scales, giving the bands a dark appearance; beneath it is whitish, with brown scales intermixed. Claws of anterior and mid feet unequal, the larger biserrated, the smaller uniserrated; claws of posterior feet equal and uniserrated. Petiole of first submarginal cell about half as long as this cell. Length 4.5 mm. Otherwise as in the female.

Described from three ♂ and one ♀ bred from larvæ gathered on Garret Mts., Paterson, N. J.

Type: in the collection of the New Jersey Experiment Station.

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## A New Cryptine from the Nest of *Ceratina Dupla*.

By H. L. VIERECK.

**Habrocryptus graenicheri**, n. sp.

Superficially, this species resembles somewhat *C. atricollaris*, but differs in having the thorax and abdomen partly black and in the more distinct sculpture.

♀ 10 mm.; ovipositor 3 mm.

Head rather shining and covered with rather shallow, adjoining small

punctures, the occipital ridge very sharp; clypeus polished; scape rather pear-shaped, short and chunky; pedicellum wider than long; first joint of the flagellum nearly twice as long as the scape; antennæ twenty-seven jointed; greater portion of the thorax sculptured and shining nearly like the head; propleura rather transversely striated; the segment of the mesopleura immediately beneath the wings smooth and polished on the lower half, punctured on the upper half; scutellum polished, sparsely punctured; metanotum rugulose punctate, the posterior face rather rugose, basal area quadrate or nearly, polished, bounded by indistinct raised lines, two transverse, angulated, broken, raised lines extending across the metanotum from pleuron to pleuron and dividing the segment nearly into thirds, sinuate laterally, with a small curve extending anteriorly and a large curve posteriorly, in the middle of the segment straight and nearly parallel, forming the anterior and posterior boundary of the incomplete areola; wings clear, nervures and stigma very dark brown, areolet pentagonal, the sides converging above, the second abscissa of the radius nearly as long as the side of the areolet or the transverse cubiti.

Abdomen dullish, with small adjoining punctures, the apical segments more shining, the basal segment polished, smooth and not sculptured, with three lateral, longitudinal carinæ, the middle carina most prominent and almost bisected by the spiracle, the upper carina faint and obsolescent on the posterior half; the lower carina is a distinct, almost straight raised line.

Superficially appearing bare, but covered with short white, almost abundant pubescence that is erect, ferruginous, head black except an orbital undulate border that is broken between a point near the middle of the posterior edge of the eye and a point almost opposite the anterior ocellus, and extends down to near the insertion of the mandibles; a spot on each mandible, basal joint of maxillary palpi and joints eight, nine, ten and eleven above and laterally, all of which are yellowish, almost cream color; prothorax black except the anterior margin, which has a yellowish border, and the borders of the pleura, which are yellowish and brownish; anterior coxæ black internally, creamy white externally; proximate trochanter black with an apical yellowish border; distal trochanter blackish and brownish; mesonotum and sutures around scutellum and postscutellum black; scutellum yellowish, almost white; postscutellum ferruginous; tegulæ, tubercles and extreme upper edge of mesopleura anteriorly cream color or nearly; a border of blackish beneath the cream edge of the mesopleura; middle coxæ rather testaceous, brownish above, the trochanters brownish; tarsi and claws of four anterior legs and outer side of tibiæ brown, the inner side of these tibiæ yellowish; posterior legs ferruginous; distal trochanters, tibiæ, basal and apical joints of tarsi and claws brown; fourth abdominal segment blackish; fifth, sixth, seventh and eighth joints black, the seventh with a large

white spot covering nearly all of the dorsal surface of the segment; sheaths of the ovipositor black, ovipositor brown.

Type: Acad. Nat. Sciences, Philadelphia.

Type locality: Milwaukee, Wisconsin.

One specimen July 30, 1904. (S. Graenicher). Bred from nest of *Ceratina dupla*.

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## **Anasa Tristis DeG.; History of Confined Adults; Another Egg Parasite.**

By A. ARSENE GIRAULT.

On May 15th, 1904, a pair of these bugs, found in copula on a squash plant, were confined without separation, in a glass jar covered with cheese-cloth, and containing several inches of fresh earth; a fresh leaf of their food-plant was added from day to day.

They remained connected for some time, but were found separated on the morning of the 16th. However, sexual connections continued, off and on, until the morning of the 21st, when they were last observed. On the morning of the 23rd, the ♀ was found dead, without depositing any eggs. The ♂ remains in good condition.

Upon dissection, the abdomen of the ♀ was found to be almost devoid of contents, and no eggs were present. This was, at first, inexplicable, but was later explained by the appearance, on the morning of June 7th, of a large Tachinid with an orange abdomen, found flying noisily about in the jar. That a ♀ thus infested should go naturally about her functions seems peculiar at first thought.

On the 9th of June, morning, another ♀, captured from a squash plant was introduced into the jar with the original ♂. The following morning they were sexually connected, showing the ♂ to be polygamous, and hence liable to be found in relatively smaller numbers. Again, on the 19th of June, they were in copula, while the ♀ had previously oviposited as follows: June 15-16, 23 eggs; June 16-17, 22 eggs; June 18-19, 13 eggs, all of which were fertile. At 2 P. M., the 20th of June, the female was found ovipositing on a stem of a

fresh leaf. She had already deposited 10 eggs, when she was accidentally disturbed. A few moments afterwards, the pair were found again connected. On the mornings of the 22d of June and 2nd of July records of sexual connections were made, and doubtless copulation had been taking place during the time intervals between these records.

On the 2nd of July both of the insects were in good health, and fed quite often on the fresh leaves when they were supplied each morning, the punctures making a dark-green, "moist" spot, characteristic of the injury of haustellate insects to tender vegetation.

On July the 13th the ♂, having gradually grown weaker and weaker, died. It had lived 58 and one-half days in confinement. Six days later or on the 19th, the ♀ died. She lived 40 days, and deposited in that time 154 eggs. Depositions, other than those given in the foregoing, were as follows: June 21-22, 13 eggs; June 24-25, 13 eggs; June 28-29, 10 eggs; July 1-2, 22 eggs; July 3-4, 12 eggs; July 5-6, 7 eggs; July 7-8, 8 eggs; July 9-10, 1 egg, final deposit; previous deposits, 68 eggs; eggs in ovaries, 0 eggs.

This shows very plainly that the period of oviposition is quite lengthy, and that the largest masses found do not even indicate the normal number of eggs deposited by this species, as is intimated in the various writings on this insect. As our knowledge grows, we are finding continually that the ratings of the number of eggs deposited by some of our commonest and most injurious insects are entirely too small, and in many cases entirely too vague (being founded as they are on indefinite egg masses, on ovary contents, or even on estimates merely). For instance, I have shown\* that the common bag-worm (*T. ephemeraformis*) DEPOSITS EGGS TO AN AMOUNT double that previously estimated, and that the ratings of the number deposited by the American tent-caterpillar (*C. americana*) were far too low. † A more striking example, however, has recently come to my notice. One of our most common, wide-spread and injurious insects, one which has been the

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\* ENTOMOLOGICAL NEWS, 1901, page 305.

† ENTOMOLOGICAL NEWS, 1904, pages 2-3.



subject of investigations for the past forty years by several distinct boards of trained entomologists, and about which several volumes have already been written, was thought to deposit not more than 500 eggs. That estimate was taken as a maximum. About a year ago, one of the insects in confinement actually deposited, in round numbers, two thousand eggs; and several months ago, another female in confinement, actually raised this by one-half, depositing three thousand eggs, or six times the first, and generally accepted estimate.

On the mornings of the 10th and 11th of June, *Hadronotus carinatifrons* Ashm., was observed ovipositing in the eggs of *Anasa*, and afterwards many of them were bred in confinement. They were at first taken to be *H. anasæ*, but a comparison of the descriptions indicated otherwise, and Dr. Ashmead later kindly determined them as *carinatifrons*.

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## Collecting Trip to Tulare County, California.

During the Month of May, 1904.

By CHARLES FUCHS.

My collecting trip in Tulare County started from Visalia to the Giant Forest to an elevation of about 7000 feet, and I can call the result successful in regard to having collected some rare and interesting beetles.

From Visalia I went to San Joaquin Mill, five miles, to collect a variety of *Cicindela pusilla* var. *lunalonga* Schaupp, of which species the type is in my possession. This species was very rare until Dr. Van Dyke discovered it in Tuolumne County. I have been successful in securing many specimens with the different varieties ranging to black without any markings whatever on the elytra. Of *Cicindela vulgaris* var. *vibex*, which species is found with *lunalonga* on alkali ground near water, I could find only four. Maybe I came too late. October and November, according to Mr. Ralph Hopping, will be the time to collect both species again and *vibex* (fide Hopping) will have a brighter green in the fall than in the spring.

On the way from San Joaquin Mill to Kaweah (1000 feet elevation) I beat willow with good results. In Kaweah,

Redstone Park, for eight days I had very good results. I shall mention here only a few species of importance. *Scaphinotus subtilis* Schaum. on very damp spots near water, rare; *Asida capitosa* Horn on very dry spots on the road or hills where I found them usually climbing up on the grass, not plentiful; *Phobetrus comatus* Leconte, at sunset coming out of the ground, especially under oak trees, flying about fifteen minutes, all males. Females stay at the entrance of their homes. I secured larvæ by digging in the ground, plentiful. *Cenonycha rotundata* Horn, attracted by light, rare. I was very much disappointed in not being able to secure in the Lucanidæ that most interesting species of *Diphyllostoma fimbriata* Fall, new genus, new species, discovered by my friend, Mr. Hopping, in Redstone Park, May 8th, and described by Professor Fall in the Canadian Entomologist, Vol. 33, No. 11, 1901. I made use during eight days of all my experience to find it. At sunset this beetle is found sitting on the tip of a spear of grass. The surrounding trees are oaks which I have investigated carefully. Next year I shall have to try again.

On my way to the Giant Forest from the entrance in the Sequoia National Park, 3000 feet, I collected *Omus intermedius* Leng, to 4000 feet under stones, but only on the north exposure of the mountain road. Of *Calosoma latipennis* Horn, only one; *Melœ barbarus* Lec., two specimens. *Metrius contractus* var. *sericeus* Rivers, not rare. Three different species of the genus *Scaphinotus*, one of them probably a new species. The *Ceanothus* bushes in fresh bloom furnished interesting material. At 5000 feet elevation, the region for *Omus lævis* Horn, begins and continues to 7500 feet and to 11,000 feet, the smooth form of *O. lævis* may be collected everywhere, under stones, fallen trees and boards; deep snow prevented my going so far up. Mr. Hopping found on the *Ceanothus* flower a beautiful *Clerus eximius* Mann., 4200 feet, twice the size of specimens found at Berkeley. Colony Mill, 5415 feet, *Zopherus granicollis* Horn, only one. Different specimens of Cerambycids and fourteen different Scolytides on the fly at sunset. *Scaphinotus oreophilus* var. *riversii*, Roeschke, is to be found from here to an elevation of 7500 feet, not rare.

In the small material collected on the fly at sunset in Giant Forest and Sierra Camp I found many minute specimens new to my collection, of which I shall give a later report when worked up.

## Formica sanguinea, subsp. rubicunda, Em. and Xenodusa cava Lec. ;

or the discovery of pseudogynes in a district of Xenodusa cava Lec.

By PROF. H. MUCKERMANN, S.J.,

Sacred Heart College, Prairie du Chien, Wis.

It may be known to the reader that in 1895 E. Wasmann, S.J., advanced the hypothesis that the so-called pseudogynes ψευδής = false, λυγή = female, in the colonies of *Formica sanguinea* owe their existence and development to the rearing of the beetle *Lomechusa strumosa* F. The morphological characteristics of these pseudogynes will be easily understood from the accompanying figures. In the case of common workers (Figs. 3 and 2c) we find the pronotum strongly developed, whilst the mesonotum is but small. The normal female (Fig. 2a), on the contrary, has a small pronotum and a strongly developed mesonotum. The *pseudogyne* (Fig. 4 and 2b) combines with the size and abdomen of a worker the mesonotum of a female ; it makes the impression of a deformed female as well as of a deformed worker. A *pseudogyne* is a frustrate creature, a ruined existence. Not being able to lay eggs or to perform the functions of workers, it is a useless burden of the colony and tends to finally degenerate the species.

After a careful research of five years, during which he examined and studied with the closest attention no less than 410 colonies of *Formica sanguinea*, Wasmann succeeded in raising the following four propositions to establish these :

1. The districts of pseudogynes always coincide with the districts of *Lomechusa strumosa*.
2. The colonies of *Formica sanguinea* containing pseudogynes are always the centres of the districts of *Lomechusa strumosa*.
3. Without the districts of *Lomechusa strumosa*, there are no pseudogynes to be found in the colonies of *F. sanguinea*.
4. No pseudogynes exist in colonies of *Formica sanguinea*, where *Lomechusa strumosa* is found in the imago stage, but they exist only in those colonies in which the larvæ of *Lomechusa strumosa* are reared for a number of years.

The above propositions Wasmann succeeded in verifying not only for *Formica sanguinea* and *Lomechusa strumosa*, but also for *Formica rufa* L. and *Atemeles pubicollis* Bris, or *Lomechusa strumosa* ; for *Formica rufibarbis* F. and *Atemeles paradoxus*

Grav. ; for *Formica fusca* L. and *Atemeles emarginatus* Payk., etc., etc.

Now this array of facts was gathered in Europe, but it led the famous biologist to surmise that probably a similar relation existed between the American *Xenodusa cava* Lec. and its hosts, namely : *Camponotus pennsylvanicus* Deg., *Camponotus ligniperdus* var. *pictus* For., *Formica sanguinea* subsp. *rubicunda* Em., *Formica pallidefulva*, subsp. *schaufussi* Mayr.,\* and *Formica exsectoides* For.

However, no pseudogynes had as yet been observed in any of the colonies of the ants just mentioned.

Wasmann, therefore, repeatedly called my attention to this, and in his letter of March 19, 1901, directed me to attend especially to the following points : (1) Which is the host that rears the larvæ of *Xenodusa cava* ? and (2) Do the colonies of that host contain pseudogynes ?

On August 23, 1900, I had been so fortunate as to find near Prairie du Chien, Wis., seven specimens of *Xenodusa cava* (Fig. 1) in a nest of *Camponotus pictus*. Subsequently I examined and searched not only the nest of *C. pictus*, but all the nests in the neighborhood with the hope of discovering, if possible, the larvæ of *Xenodusa cava* and the supposed pseudogynes. The task was tedious and discouraging. The soil which the ants had chosen for their subterranean habitation was rather stony ; besides, the time when the *Xenodusæ* were found was precisely the period in which some ant-guests change their hosts, so that it was altogether doubtful whether the specimens sought for would be contained in the nest of *Camponotus pictus*. In fact, it was not before the October of 1901, after many expeditions during the entire spring and summer seasons, that my efforts were crowned with success. In a colony of *F. rubicunda* within some 100 feet of the place where *Xenodusa cava* was originally observed, a number of true pseudogynes were discovered. They are shown in the accompanying photograph (Fig. 2). Great was my joy when beholding for the first time these helpless creatures with their small abdomen and strongly developed mesonotum. Their whole behaviour excellently corresponded to the descriptions I had read in the writings of Wasmann, and their strange thorax in particular closely resembled that of the pseudogynes of *Formica sanguinea* received from Holland. This is, to my knowledge, the first case observed in this country of pseudogynes found in the district of *Xenodusa cava*.

Now from analogy, it was a priori probable, that the same

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\*This fact I owe to Professor Wheeler, who wrote in his letter of September 8, 1902, that he had found *Xenodusa cava* in nests of *F. schaufussi* and *C. pictus* on several occasions.

causal relation, which Father Wasmann had established for *F. sanguinea* and *L. strumosa* should exist between *F. rubicunda* and *X cava*.

But in spite of continued investigations I was unable to substantiate this proposition any further, and in all probability there is no hope at present to secure new material in this region.

In the spring of 1902 the only nest of *F. rubicunda* which contained pseudogynes and was located in the district of *Xenodusa cava*, was found totally destroyed by heavy rains. In the numerous other nests of *F. rubicunda* there were no traces of either pseudogynes or larvæ of *Xenodusa cava*.

It is hoped, however, that this brief notice will suffice to induce such as are interested in the biology of ants to give their attention to the remarkable relation mentioned above, as well as to search for further facts which would confirm the one observed in this region.

I close this paper by calling the attention of the reader to the interesting question how this strange relation between the existence and development of pseudogynes and the rearing of the larvæ of *Xenodusa cava* ought to be explained. Wasmann is of the opinion that the repeated rearing of the beetle causes a gradual change in the brooding instincts of the ants, so that the pseudogynes are but a developmental stage of such larvæ, as were originally destined to become females, but in course of their later development were transformed into workers. Besides, an interesting psychic problem is suggested by the fact that it is the fault of the ants themselves that these encumbrances on their commonwealth come into existence and multiply with such rapidity.

Of the numerous publications of E. Wasmann, S.J., on this subject we mention especially the following:

1. Die ergatogynen Formen bei den Ameisen und ihre Erklärung. Biologisches Centralbl. XV., 1895, pp. 606-646.

2. Kritisches Verzeichnis der myrmekophilen und termitophilen Arthropoden. Mit Angabe der Lebensweise und Beschreibung neuer Arten. Berlin, 1894.

3. Neue Bestätigungen der Lomechusa-Pseudogynentheorie, Verhandlungen der deutschen Zoologischen Gesellschaft, 1902, pp. 98-108.

#### EXPLANATION OF PLATE XX.

Fig. 1.—*Xenodusa cava* Lec. (original).

Fig. 2.—*Formica sanguinea* subsp. *rubicunda*, Em. a = female; b = pseudogyne; c = normal worker (original).

Fig. 3.—Thorax of a normal worker of *F. rubicunda* (original).

Fig. 4.—Thorax of a pseudogyne of *F. rubicunda* (original).

## On the Discovery of Fig-insects in the Philippines.

By WILLIAM H. ASHMEAD.

Representatives of nearly all the known families of the Hymenoptera are rapidly being discovered in the Philippine Islands, and I have now the pleasure of recording the discovery, by Father Robert Brown, of fig-insects or, better, fig-wasps in the archipelago belonging to two distinct families,—Fam. Agaonidæ, or genuine fig-wasps, and Fam. Torymidæ, sub-fam. Idarninæ, or parasitic fig-insects.

The two species are described below.

### Family AGAONIDÆ.

Genus **KRADIBIA** Saunders.

#### **Kradibia brownii** n. sp.

♀.—Length 0.9 mm.; ovipositor short, about one-third the length of the abdomen. Black and shining, the eyes pale, the scape and pedicel of the antennæ rufo-testaceous, the flagellum black or brown-black, the five last joints enlarged, the last joint the largest, oval; the legs—except the hind coxæ, which are black, and the very long tarsi, which are white—are brownish yellow; the wings are hyaline, but with the veins dark brown, the stigmal vein being slightly longer than the marginal, the postmarginal much longer.

Type, No. 8177, U. S. N. M.

Manila. Described from a single specimen.

This genus was originally described from Australia.

### Family TORYMIDÆ.

Genus **SYCORYCTES** Mayr.

#### **Sycoryctes philippinensis** n. sp.

♀.—Length 1.4 mm.; ovipositor very long, nearly twice as long as the whole insect and clavate at tip. Brownish yellow, the eyes brown, the dorsum of abdomen towards base with a black spot, the sheaths of the ovipositor entirely black; the scape of the antennæ and the legs are pale yellowish, the flagellum being brownish; the wings are hyaline, the veins pale yellowish; the long stigmal vein is a little shorter than the marginal, the postmarginal vein being long.

Type, No. 8178, U. S. N. M.

This genus was originally described from Java, but I have representatives of it from Australia and New South Wales not yet described.

# ENTOMOLOGICAL NEWS.

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PHILADELPHIA, PA., DECEMBER, 1904.

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There is one thing appertaining to entomology that has not developed in proportion to the growth and demand of the study. We refer to the entomological supply business. The commercial people have not seen the enormous increase of interest in our study and there is almost no competition among dealers in this country. In Europe the journals contain many advertisements of dealers offering all kinds of supplies and doubtless one can obtain almost anything promptly, while in this country there are only a very few dealers and they appear incompetent to properly handle the business. In Philadelphia with over a million people and many persons interested in entomology, there is not a single place where one can get satisfactory entomological supplies. If a museum or individual wishes insect boxes, from six months to a year will elapse before they are supplied, and one must suffer from stagnation and paralysis in caring for additional specimens or rearranging old. If a few thousand specimens are received they crowd up the temporary receptacles and must wait two or three months for printed pin labels before they can be incorporated in the collections, as it is impossible to get labels promptly. We have heard all the explanations and excuses for this condition of affairs and believe none of them valid. Is there not a man who will go into the business who is not suffering from the sleeping sickness? We believe a live, wide-awake firm or individual could build up a fine business in entomological supplies and appliances, but the business must be thoroughly understood.

## Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS  
OF THE GLOBE.

PROF. LEVI W. MENGEL has submitted to me a moth and a butterfly new to the fauna of the United States:—*Amblyscirtes elissa* Godman & Salvin, Biol. Cent.-Am., Tab. 95, fig. 40 ♀, fig. 41 ♂, Mexico; Cochise Co., Arizona, Biederman; *Melanchroia monticola* Schaus, Ent. Amer., 5, 192, 1889, Las Vigas, Mexico, Biol. Cent.-Am., Het., 2, 408, pl. 73, f. 33, 34; Reef, Cochise Co., Arizona, August 29, 1904, Biederman.—HENRY SKINNER.

ON THE METHOD OF "OARING" IN WATERBUGS (HEMIPTERA).—In "Half-hours with Insects,"\* p. 158, Packard writes: "In this insect (i. e., *Notonecta*), as well as in *Corixa*, as Schiödtte observes, the hind legs are moved both together, as in *Dytiscus*. In *Belostoma*, and probably *Ranatra*, they are moved alternately." Notes on the habits of waterbugs have been few and obvious, though the American forms at least are being zealously investigated by my friend Mr. Bueno.

*Ranatra* and *Nepa* are crawlers, slow and deliberate, over the bottom of pond or lake, or cling to the submerged parts of aquatic plants; even when moving through the water, their gait is rather a kind of paddling. *Belostoma*, on the other hand, has good serviceable oars (though not so remarkably modified for that purpose as in *Notonecta*), and alternate movements of the legs would produce much the same effect as that of a tyro rowing crew heedless of "time."

I have never seen any of the *Belostomida* alive; but I am sure, from an examination of their structure, that Packard's statement is incorrect. Unfortunately, the giant race has not yet reached these peaceful shores. My position in the matter is somewhat like that of Pooh-Bah. As a lover of waterbugs I would welcome them with open arms; as a professional economic entomologist, it would undoubtedly be my dolorous duty to exterminate them.

G. W. KIRKALDY.

Honolulu, H. I., June 14, 1904.

EPIPYROPS BARBERIANA Dyar.—Recently Mr. Carl Hartman, of Austin, Texas, sent me a letter, accompanied by three specimens of *Epipyrops barberiana*, one male and two females, and a specimen of a Fulgorid, *Ormenis pruinoso* Say. Mr. Hartman in his letter says:

"There is a close social relation between the moths and the wax-producing Fulgorid. The latter insect carries under the left wing the mass of wax, or rather the waxen sac (several of which I send you) until ready to deposit the same. The lantern-fly lives, it seems, on the cedar bushes of this vicinity, and it is on them that the waxen sacs are almost exclusively found. The wax, when the sac is deposited, is soft and sticky, and can be drawn out into microscopically fine threads, a foot or

\*"Half-hour Recreations in Natural History," Div. 1, pt. 5—Insects of the Pond and Stream. (No date—1874-5).



more in length, by touching the wax and removing the finger to a distance. The sacs are then pasted on the upper side of the sprays of cedar in the manner which you can see from the specimens. I got several insects and placed them in bottles over night. The sacs had been pasted to the bottles, and in doing this the wax had been smeared over a small area around the sacs in an 'untidy' fashion. In each case the Fulgorid was dead in the morning. It was from these sacs that the moths I send you were reared.

"I gathered, on September 10th, a dozen sacs and placed them in a bottle, with the result that two moths appeared on September 13th, and a chalcid-fly, which latter I shall send to Dr. Ashmead. The latter is most probably parasitic on the larva of the moth."

The observations of Mr. Hartman are of very great interest, and I hasten to communicate them to the ENT. NEWS. W. J. HOLLAND.

Carnegie Museum, Pittsburgh, Pa., June 14, 1904.

MEXICAN AND CENTRAL AMERICAN DRAGONFLIES (ODONATA).—I shall be glad to examine, name and return to the owner, or to purchase or otherwise acquire, Mexican and Central American dragonflies, in order to add to our information on this group for the *Biologia Centrali-Americana*. I particularly request any one having even one or two of these insects from these countries to communicate with me on this subject.—PHILIP P. CALVERT, Acad. Nat. Sciences, 1900 Race St., Philadelphia, Pa.

COCYTIUS CLUENTIUS Cr.—I took a specimen of this species at Detroit, Mich., July 11, 1904. Mr. A. W. Andrews and myself had been hunting sphinges, etc., on milkweed blossoms; but as our success was indifferent, owing to the immaturity of the flowers, we decided to examine the electric lights of Highland Park village. We at once met with success, and at the fourth or fifth light visited I found a huge sphinx, larger than any hitherto known to us around Detroit. It was lying on the asphalt pavement about fifteen feet from the base of the pole. Unfortunately, it had been injured, apparently by a passing wheel; yet it was bright and fresh and made a passable cabinet specimen. It was alive when taken, but offered very feeble resistance to capture.

The present specimen expands six and one-half inches (set in the usual way). It is a deep chocolate color, the forewing lightly irrorate with gray. Beneath the apex is a light brown patch, extending from the outer edge inwards, narrowing as it approaches—but not reaching—the middle of the wing. Along the inner margin is a large brown patch, somewhat darker than the other and crossed by several darker bands and shades. The hind wing has a pale area beyond the middle; the base is yellow, divided by a dark streak into two. The abdomen is of the same dark color above with gray irrorations, and has six yellow spots on each side. The specimen is a female.

The question arises—How did this sphinx get so far north? The nearest railroad, one-half mile away, runs east and west. Three miles south

are three other roads, connecting the city with all points of the compass. It was a hot sultry night with no wind and for the most part cloudy—an ideal night for collecting.

In the "News," Vol. II, page 334, Mr. Troschel records the capture of *cluentius* at Chicago. Surely this species should now be on our list of Sphingidæ.

W. W. NEWCOMB, M.D.

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## Doings of Societies.

A meeting of the Feldman Collecting Social was held at the residence of Mr. Frank Haimbach, 1309 Allegheny Avenue, Philadelphia, October 19th, Mr. Erich Daecke, Vice-President, in the Chair. Nineteen persons were present. Dr. Calvert exhibited larvæ and pupæ of the bee-moth and said they were for distribution among the members. He said the wood under each cocoon was gnawed out for its reception, thus forming a little depression. The robber-moth, *Acherontia atropos*, was mentioned, and Mr. Daecke said he took a fine specimen far out at sea, in the Mediterranean. Mr. Haimbach spoke of the great abundance of *Aletia argillacea* at St. Louis. He saw thousands and counted 42 on one window. Mr. Wenzel said he had been studying *Balaninus*, and found it extremely difficult to collect imagos, but had secured larvæ by the thousands. Many chestnuts from Timber Ridge, Va., contained larvæ of *B. rectus* and *proboscideus*. Mr. Huntington had seen a live scorpion brought into the Fair Grounds at St. Louis. He was under the impression that they were tropical in habitat. Mr. Viereck said the complex nomenclature of insects had not infrequently driven students away from entomology, and he gave the opinion of the Rev. Edward Everett Hale and other writers on the subject. Recently Dr. Graenicher, of Milwaukee, had sent him rare or new parasitic Hymenoptera reared from *Ceratina dupla*, which show how interesting are the biological studies irrespective of nomenclature. Mr. Greene reported the capture of *Cicindela purpurea* var. *limbalis* in Northern New Jersey in the neighborhood of Boonton on April 27th.

Mr. Daecke reported the capture of *Diachlorus ferrugatus* near Weymouth, N. J. Osten Sacken gives its distribution as

Mexico, West Indies, Honduras and Brazil. He also exhibited a new tabanid taken at Brown's Mills Junction, N. J., June 27th.

HENRY SKINNER, *Secretary, pro tem.*

A meeting of the American Entomological Society was held October 27th, Dr. Philip P. Calvert, President, in the chair. Eighteen persons were present. The President announced the death, on May 23rd, of Mr. Robert McLachlan, elected a correspondent of the Society December 10, 1866. Mr. Rehn exhibited seven species of *Taeniopoda*, which represents all the species but two. The genus can be divided into two parts by the character of the median carina of the pronotum. Since Bolivar made this division a connecting link had been found in Mexico. The species vary greatly in coloration. Upon being questioned Mr. McClendon, who had observed them in nature, said they did not fly. Mr. Ilg exhibited specimens of *Atteva aurea* taken at Philadelphia. Mr. Wenzel exhibited fine specimens of *Cychnus viduus* taken not far from the city limits, in Delaware County. They are very rare here, and the species had been taken by his father and grandfather. He also exhibited larvæ of *Balaninus rectus* and *proboscideus*. Dr. Calvert exhibited a specimen of *Somatochlora tenebrosa* taken by Mr. E. E. Wildman at Pocono Inn, Penna., August 1st, a new record for the State. It has, however, been found in New Jersey by Mr. Rhoads. Dr. Calvert read an abstract of the address of the President of the Belgian Entomological Society on the "Metamorphoses of Insects." Discussed by the members. Mr. Haimbach referred to the great variation in the larvæ of the Bombycine moths. Mr. Rehn spoke of the similarity of some adults in the Orthoptera and the difference among their nymphs. Mr. Wenzel quoted Mr. Joutel in differentiating *Saperda* larvæ by their workings in wood. Mr. Harvey exhibited some unknown galls found in ant's nests.

HENRY SKINNER, *Secretary.*

The thirteenth regular quarterly meeting of the Pacific Coast Entomological Society was held on August 20th, 1904, at the Café Odeon, 8 O'Farrell Street, San Francisco, President Fuchs in the chair.

Sixteen members and six visitors were present. Four new members were elected.

Fordyce Grinnell by letter stated that he had spent from May 30th to June 20th in the San Emiglio Mountains in Western Kern County, and ascended Mt. Pinos over 9000 feet altitude. In San Emiglio Cañon he found a species of *Lycæna* near *speciosa*; around Mt. Pinos a distinct *Satyrus*, a *Melitæa* near *gabbii*, and an *Argynnis* that he could not place, and a peculiar *Lycæna* of the *icaroides* group. On the Mojave Desert, near Lancaster, he took *Pholisora libya*, which is only found in the desert and hard to catch.

President Fuchs delivered an annual address and reported a "Collecting Trip" to Tulare County, California.

Mr. Frances X. Williams reported a collecting trip to Santa Cruz County, in June 20th-July 25th. He stated that the Hepialidæ have the habit of flying about for about 40 minutes up to 8.20 o'clock P. M. The males fly zigzag in sheltered spots, while the females are larger and darker and fly zigzag but continuously and scatter their eggs upon the ground.

Dr. F. E. Blaisdell reported a larva of *Omus sequoiarum* that was collected in Calaveras County, 1903, and that it had pupated. As soon as it was placed in a jar of earth it made a burrow and was fed on flies from June 25th to August 1st, when it closed its burrow and in a cell laid upon its back for six months, and at the end of January, 1904, it again became active and was fed on flies. About June 1st, 1904, it again closed its burrow and disappeared, but about July 15th it had pupated.

He also reported the finding of *Quedius fulgidus*, var. *erythrogaster*, *Fuchsina occulta*, *Gyrohypnus* sp., and the remains of *Aphodius cribricollis* in the wood-rats' nest in the Alhambra Valley, Contra Costa County.

Dr. E. C. Van Dyke in considering the species of *Amphicoma*, said that probably there was dichromatism in the species of the

Pacific Coast : *ursina*, the usual brown form and a rare melanotic form ; *canina* with its var. *cooperi*, and what he believed will prove melanotic forms, *edwardsii* and *rathvoni*.

Mr. L. E. Ricksecker stated that he obtained a colony of *Chariessa elegans* on white oak. Eight or ten specimens were obtained from a dead but freshly cut tree.

Dr. Blaisdell exhibited a series of *Collops* collected in Contra Costa County, showing that the quadri-maculate forms are extreme variations in the color marking of the wholly dark elytral forms. And also a series of *Lina* showing that the wholly black, with the var. *confluens* are but color variations of *L. scripta*. He stated that the specific term of *Bembidium concinnum* was preoccupied, having been applied to an European species, and in its place he proposed that the species be known as *Bembidium perconcinnum* Blais. Mr. Roland Hayward called his attention to the need of renaming the species.

F. E. BLAISDELL, M. D., *Secretary*.

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Minutes of meetings of Brooklyn Entomological Society, held at the residence of Mr. George Franck, 1040 DeKalb Avenue, Brooklyn, N. Y.

January 7, 1904.—Nineteen persons present, the President in the chair. The following were elected officers for the ensuing year : John B. Smith, President ; Edward L. Graef, Vice-President ; Christopher H. Roberts, Treasurer ; Archibald C. Weeks, Secretary ; Richard F. Pearsall, Librarian ; George Franck, Curator ; R. Ellsworth Call and Edward G. Love, members of Executive Committee, in conjunction with above-named officers.

Dr. Call reported that the Children's Museum of the Brooklyn Institute had prepared exhibits, which would be further extended showing the relations between plants and insects so far as the cross fertilization and pollinization of the former by the latter were effected.

Mr. Carl Schaeffer read a paper relating some of his collecting experiences at Brownsville, Texas, during the past season. So many of the trees, shrubs and plants were equipped

with spines or thorns that collecting was a matter of some difficulty. Insects of all orders were taken, but principally Coleoptera, of which some eighty species were not included in the North American check lists and nearly sixty species were new to science. Many of the insects taken belonged to the sub-tropical fauna which had invaded this region. Mr. Schaeffer exhibited drawings of many of the new species of Coleoptera, principally distributed among the Cleridæ, Malachidæ, Ptinidæ and Cerambycidæ, the former predominating.

Discussion by Messrs. Call, Smith, Schaeffer and Weeks as to what should govern the limits of a faunal region, with the conclusion that it was best determined by the character of the vegetation.

February 4, 1904.—Fifteen persons present, the Vice-President in the chair. Dr. Kenneth F. Junor, of Brooklyn, was elected a member. Mr. Engelhardt reported that he had found the bird's nests forming a portion of the collections of the Children's Museum infested with the larvæ of the clothes moth (*Tinea pellionella*). The materials in the nests were straw, sticks, cotton, leaves and feathers.

Dr. Call had found the same larvæ as well as those of the common *Dermestes* in the interior of dried crabs which had originally been preserved in alcohol and the same moth had riddled the wooden table covers under cases which had been standing for some little time.

Mr. Doll exhibited specimens of Lepidoptera taken by him at Brownsville, Texas, during the past summer, and described the relative rarity and previously recorded range of occurrence of each species. Many of the species were not only new to our fauna, but to science. Among them *Copidryas cosyra*, which until very recently had been limited to Mexico; species allied to *Ecpantheria*, *Dasylophia*, *Edema* and *Schizura*, new to our fauna; *Ecpantheria muzina*, a large number of imagos were obtained from a batch of 250 eggs, showing variations which had heretofore been described under independent names; *Melitæa perlula*, new to our fauna and heretofore recorded from Venezuela; *Anartia fatima*, new to our fauna and not in Dr. Holland's Book, previously recorded habitat, Cuba; *Krico-*

*gonia lyside*, many specimens taken showing great variation, probably heretofore described under various names; *Pyrgus pastor*, heretofore recorded from Mexico; *Nisoniades potrillo*, heretofore recorded from Mexico and Cuba.

March 3, 1904.—Twenty persons present, the President in the chair. Mr. Engelhardt, in extension of the discussion at the previous meeting, read a paper upon "Museum Pests, and Some of their Breeding Places." King crabs, lobsters and other crustaceans were attacked by both the larvæ of the clothes moth and *Anthrenus*, the ligaments being devoured to such an extent as to cause the joints to separate. The larvæ were active in all stages in warm rooms during the winter, despite contrary opinions. Bisulphide of carbon only partially destroyed these pests. The feathers and rags in bird's nests as well as dried bog grass, were attacked by the clothes moth. Powdered naphthaline was successfully employed in such cases. The book louse (*Atropos divinatoria*) not only devoured paste or glue used in binding, but also penetrated the shellac coating upon shells to reach the dried tissue beneath. Cockroaches and house crickets would devour insects while on setting boards. These should be laid or hung in tight closets or cabinets with powdered naphthaline sprinkled on the bottom and shelves. Mice and rats would also work havoc among living cocoons, or to an exposed collection, and were particularly persistent in their efforts to reach dried specimens of any kind.

Dr. Call mentioned that Indian garments as well as the feathers of mounted birds were frequently destroyed by the clothes moth and that in addition to carbon bisulphide he had used a toilet spray filled with corrosive sublimate dissolved in alcohol in the case of infested crustaceans.

Mr. Schaeffer suggested the thorough saturation of the interior of insect and other cases with carbolic acid, the odor of which, in his experience, had proved permanently effective without renewal.

Dr. B. S. Middleton (of Mullingar, Ireland, visitor), stated that his collection of Brazilian butterflies had been eaten by cockroaches in the hold of his ship, and Mr. Franck related

the same experience with ants in a consignment of specimens from Europe.

Discussion, in which the distribution of powdered naphthaline or carbolic acid in cabinets, closets and cases was admitted to be generally effectual for protection.

Professor Smith read a paper entitled "Some Remarks on Classification."

Discussion by Messrs. Call, Franck, Hoover and Smith, in which the improbability of an agreement on a uniform basis of classification was thought not likely to be soon, if ever, reached.

ARCHIBALD C. WEEKS, *Secretary*.

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## OBITUARY.

We have learned with regret of the death of that veteran entomologist, Professor F. G. Schaupp. He was buried at San Antonio, Texas, on November 10th. Professor Schaupp was well known from his writings on Coleoptera published in the Bulletin of the Brooklyn Entomological Society, his principal work being Synoptic Tables of the Cicindelidæ. Since his removal to Texas he has done valuable work in collecting. We trust the Brooklyn Entomological Society will publish an account of his life.

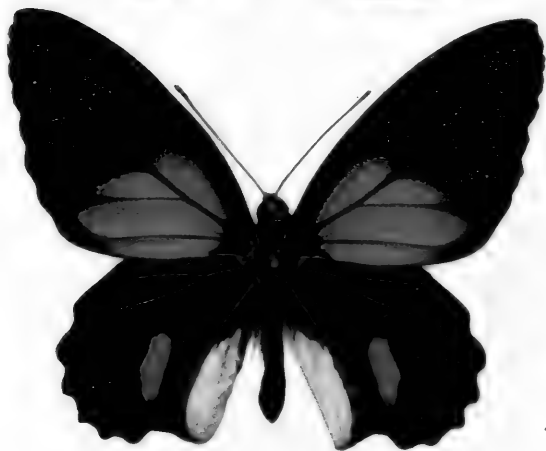
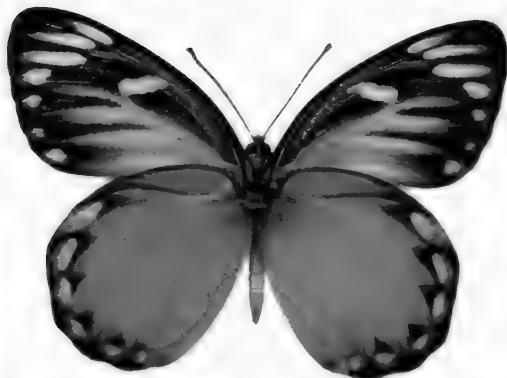
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Mr. J. T. Klein died, October 14th, suddenly, at his residence, of apoplexy, aged 58 years. He was born February 17, 1846, near Ordruf, Thuringia, where he received a good education and came to America in 1867.

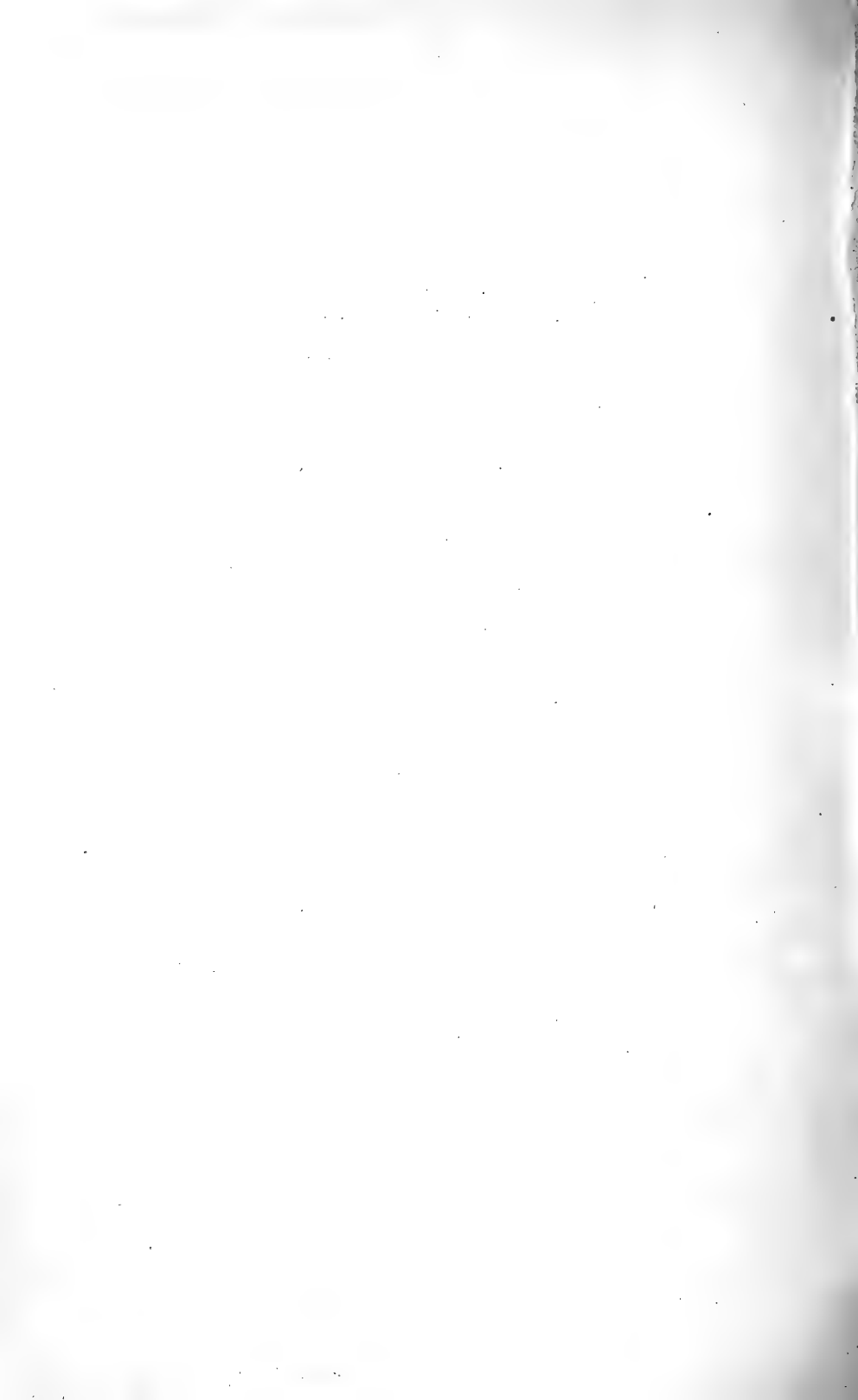
In 1872 he came to this place (Torrington, Conn.), when I became acquainted with him. He has been an ardent collector of Lepidoptera and Coleoptera, and his collection contains specimens from nearly every quarter of the globe. Through all these years he worked hard to interest others in the study of Entomology, and he was always glad to entertain visitors and show them his treasures.

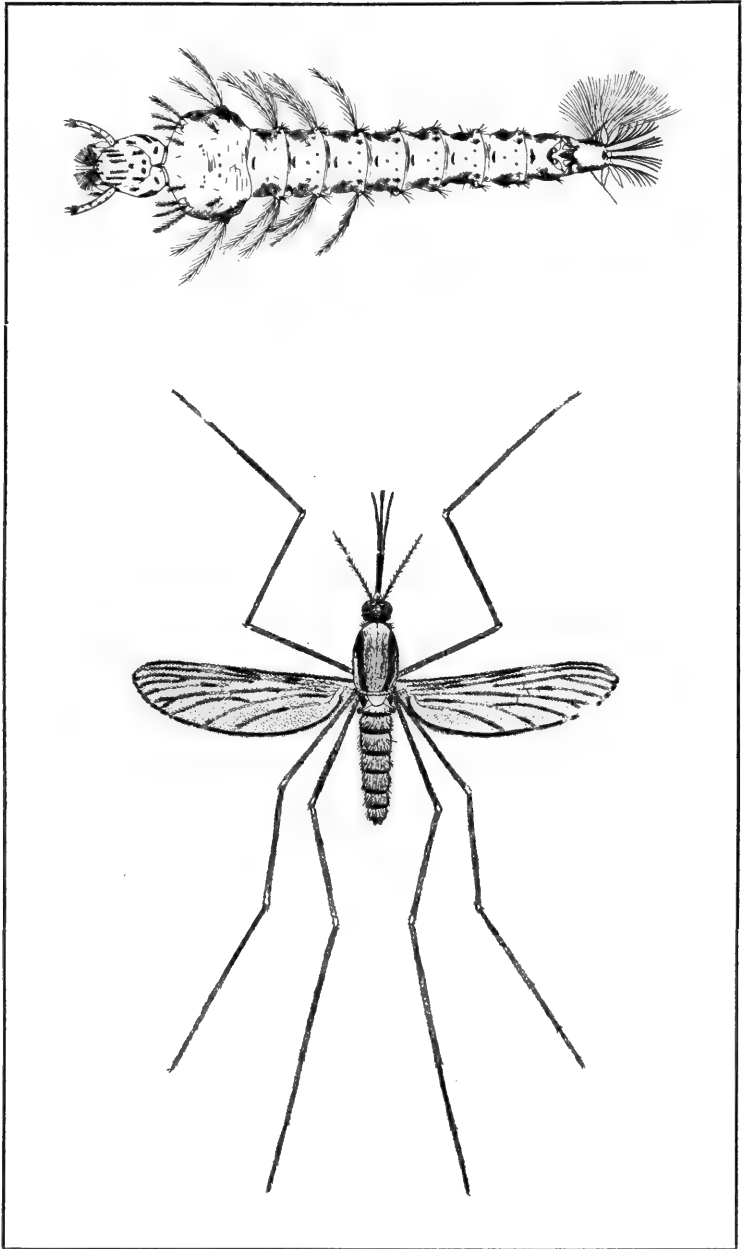
Mr. Klein was a member of the Litchfield County Scientific Association and the Entomological Society "Iris" Dresden, Saxony. A wife, daughter and son survive him.—H. H. A.





AGRIAS SARDANAPALUS (BATES).  
DELIAS DESCOMBESI (BOISD.).  
PAPILIO CEDIPPUS (LUC.).

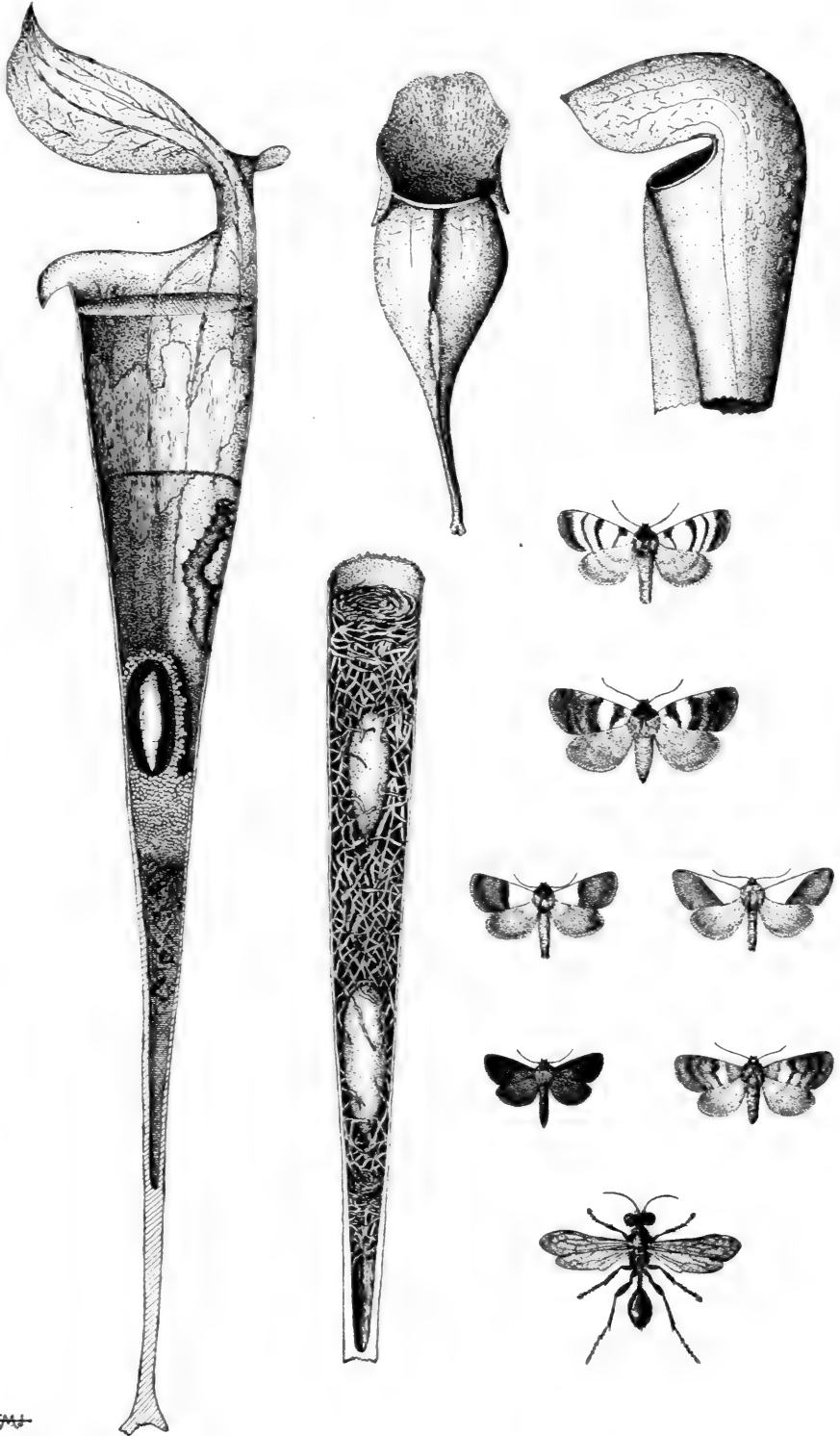




ANOPHELES FRANCISCANUS (LARVA.)

ANOPHELES FRANCISCANUS ♀.



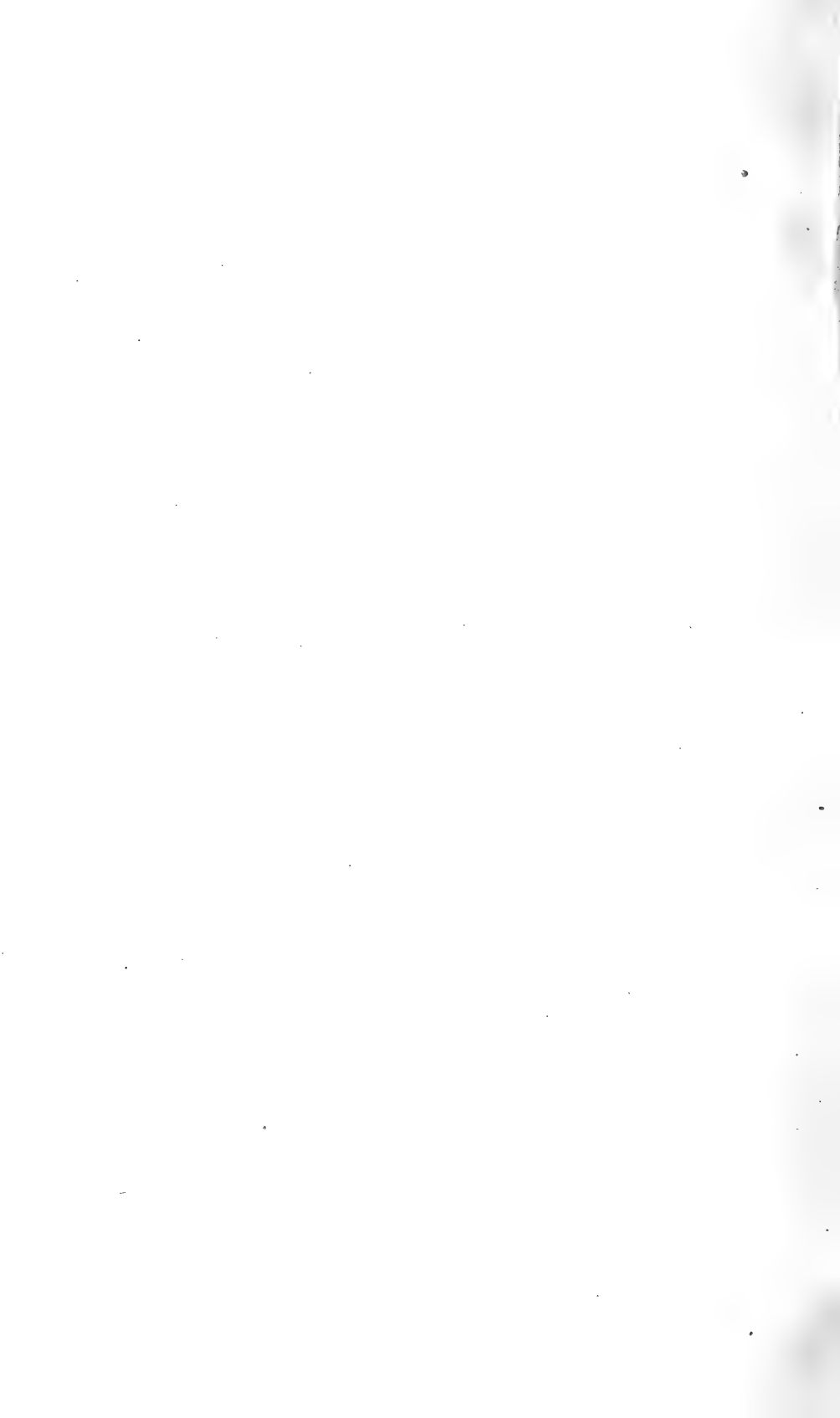


PITCHER PLANT INSECTS (JONES).





PITCHER PLANT INSECTS (JONES).

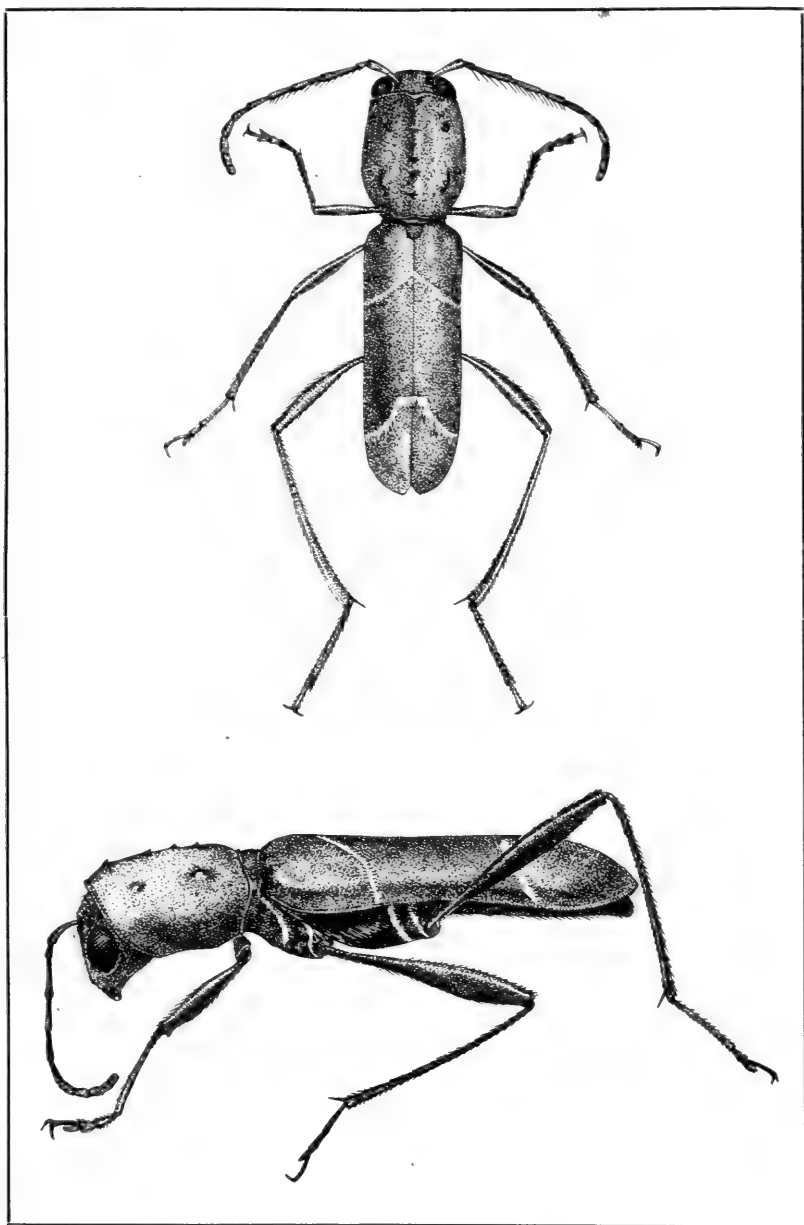




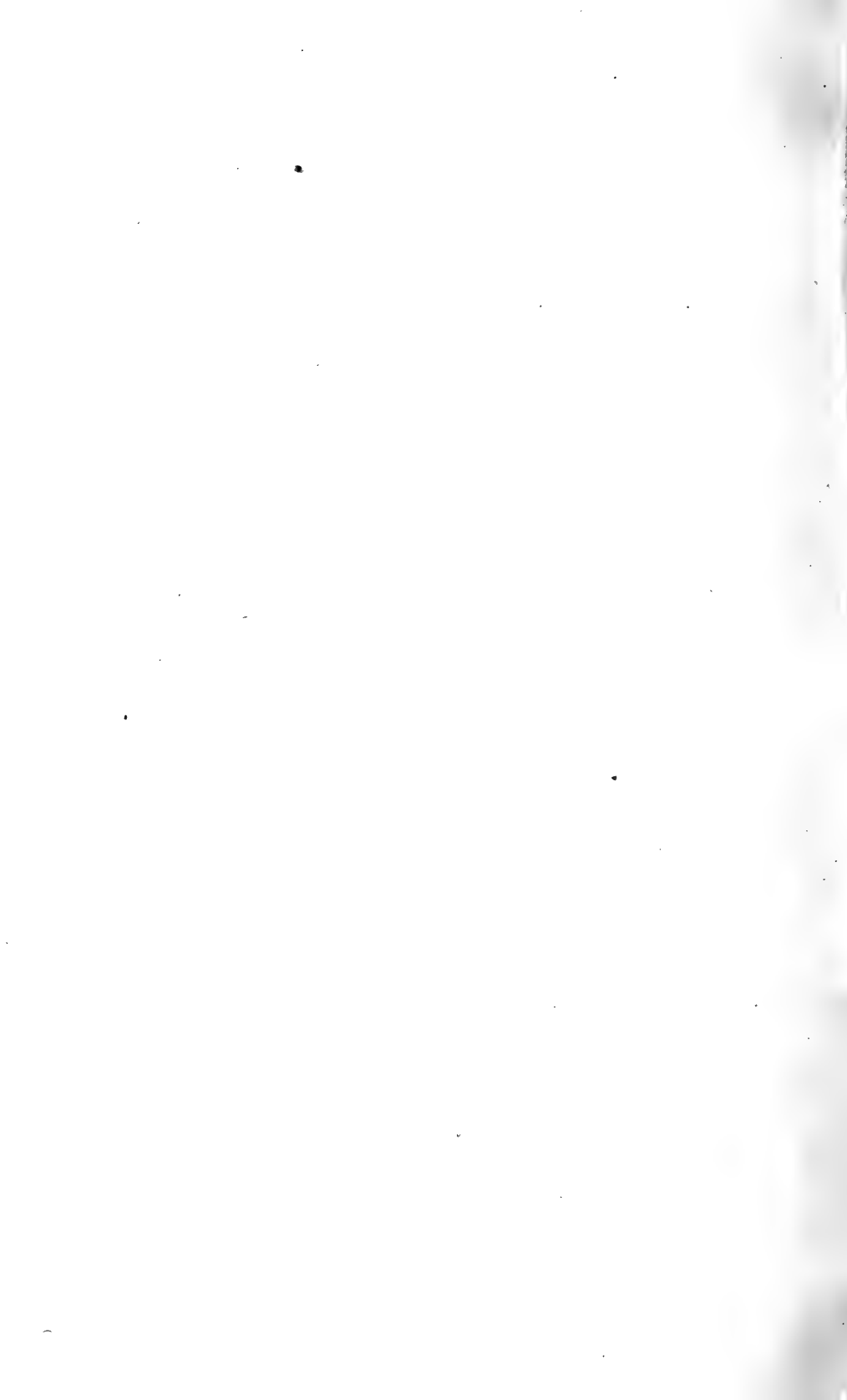


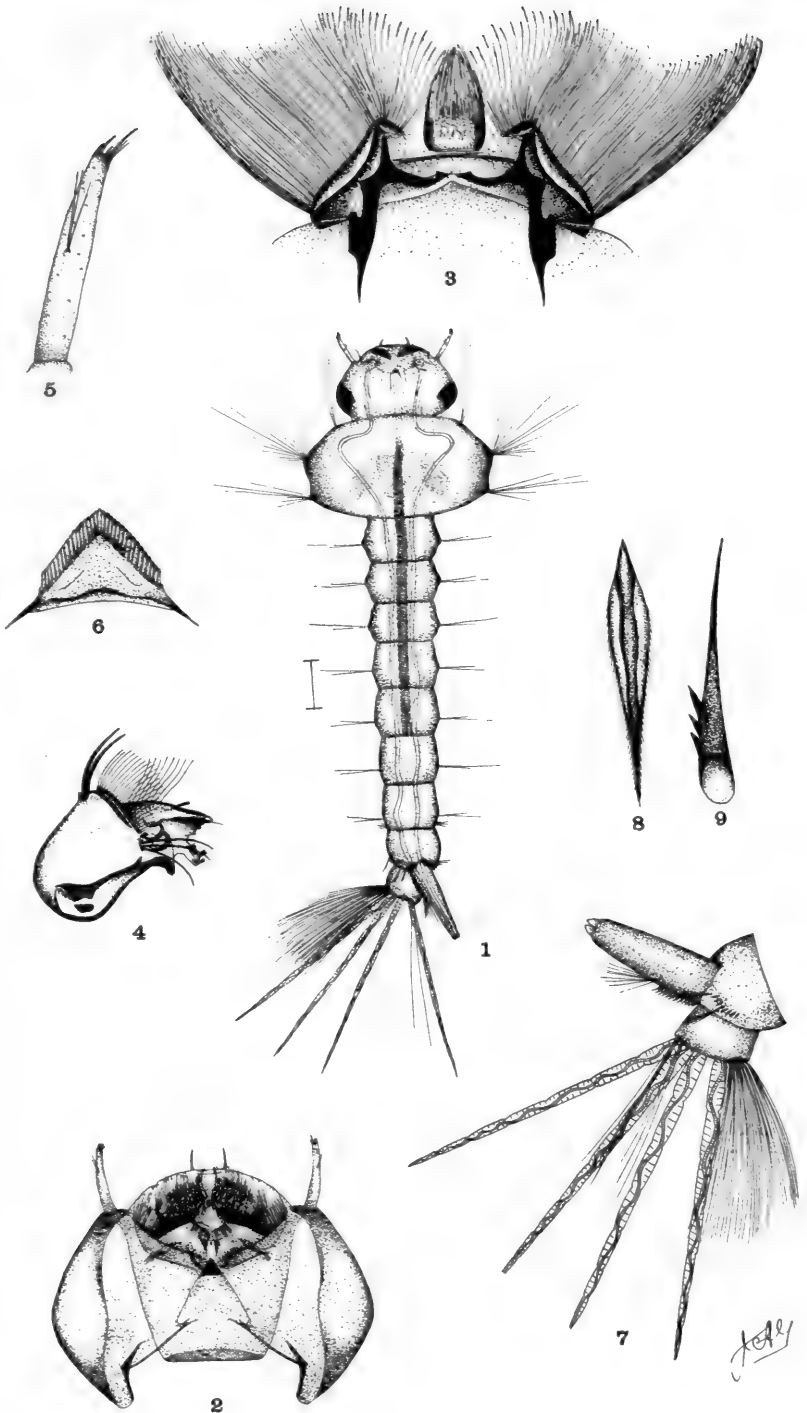
DESTRUCTIVE BEETLES (MELANDER).



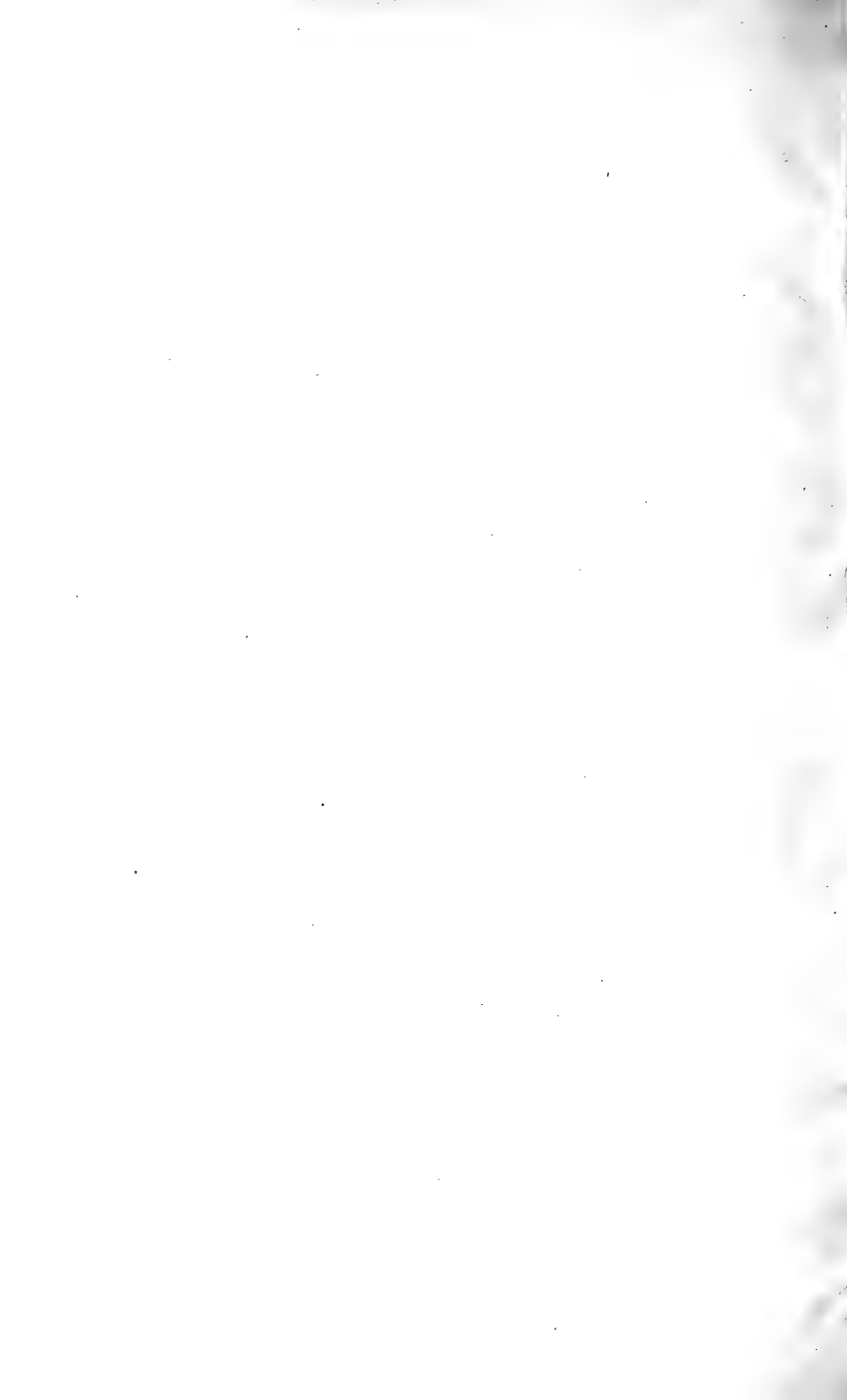


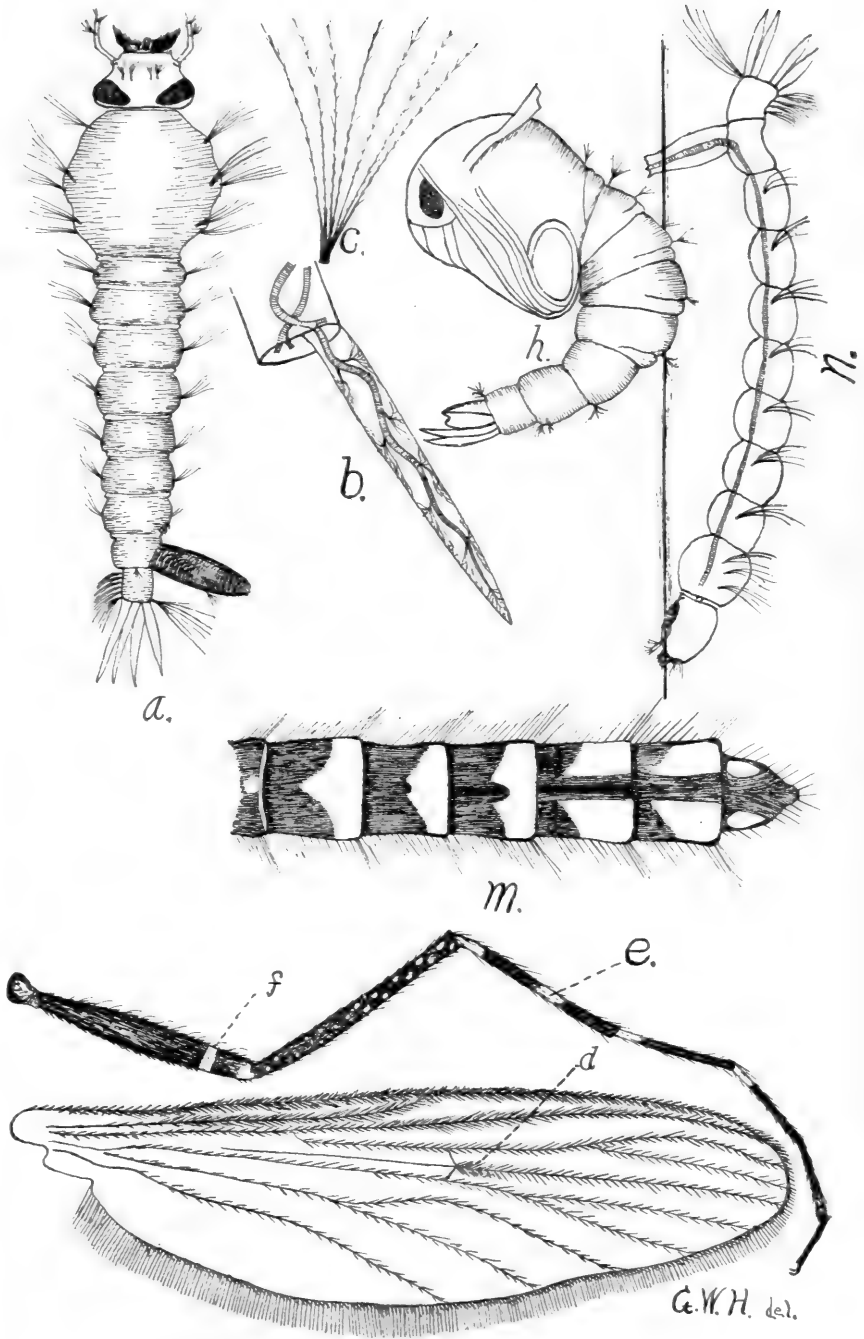
NEOCLYTUS JOUTELI (DAVIS).



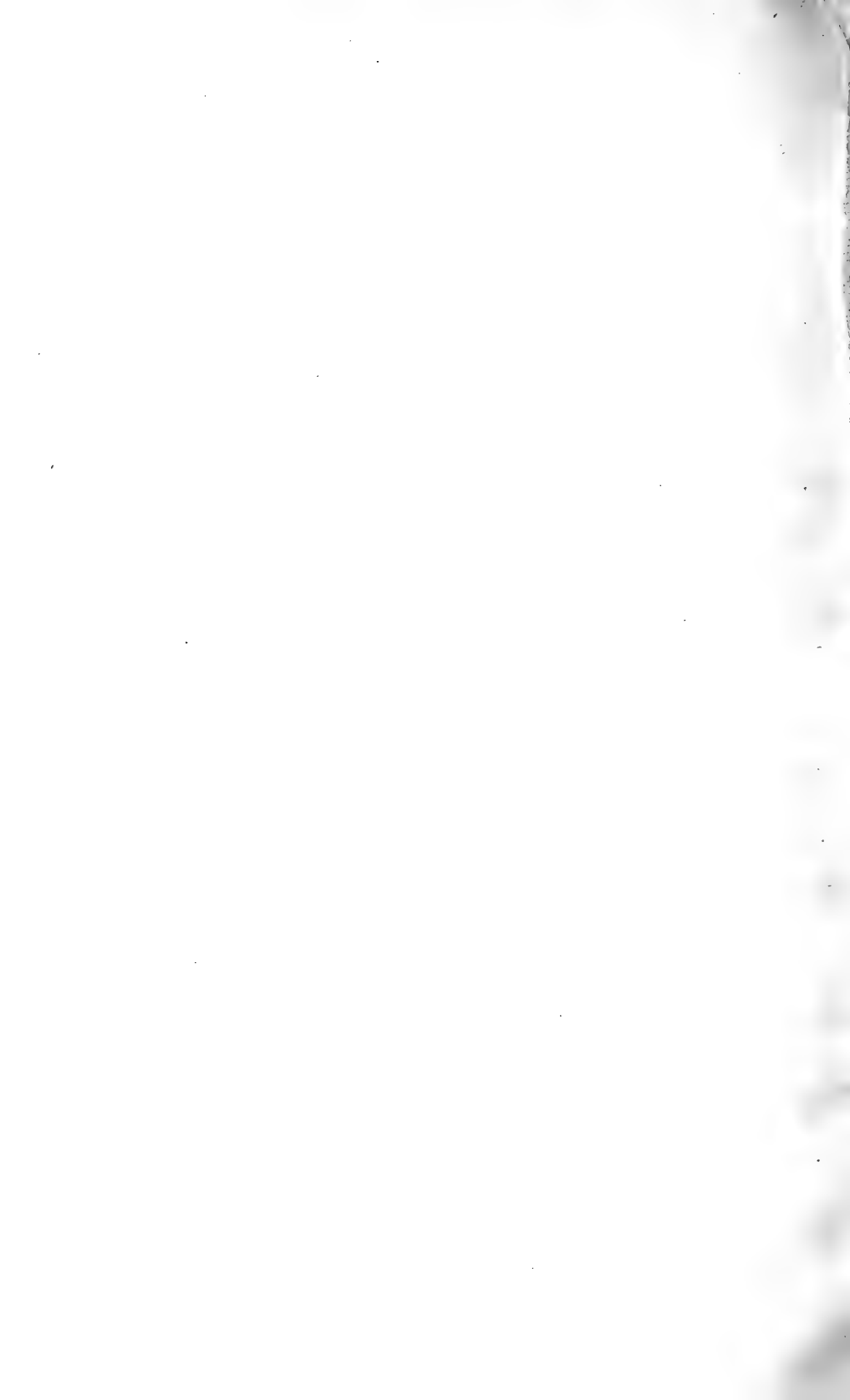


CULEX DUPREEI COQ.

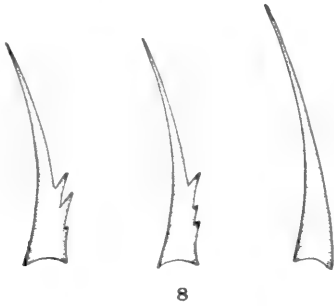
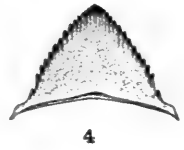
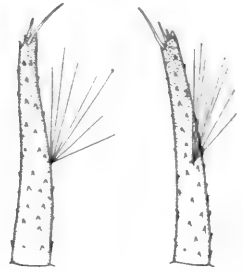
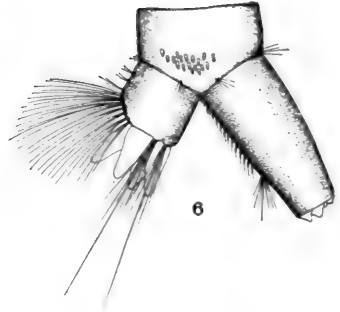
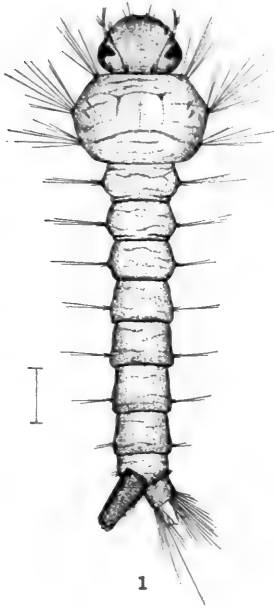




CRABHAMIA JAMAICENSIS.



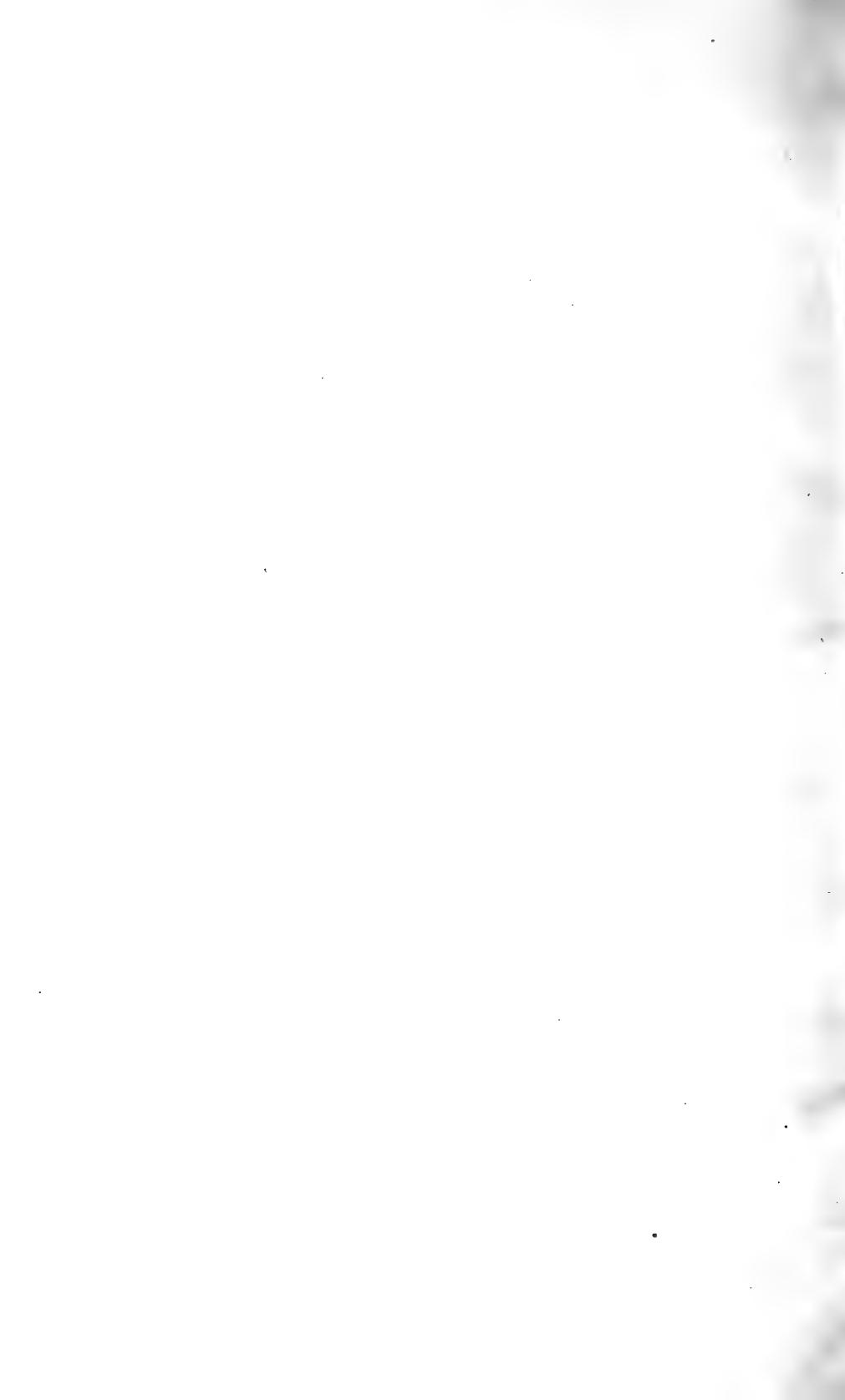


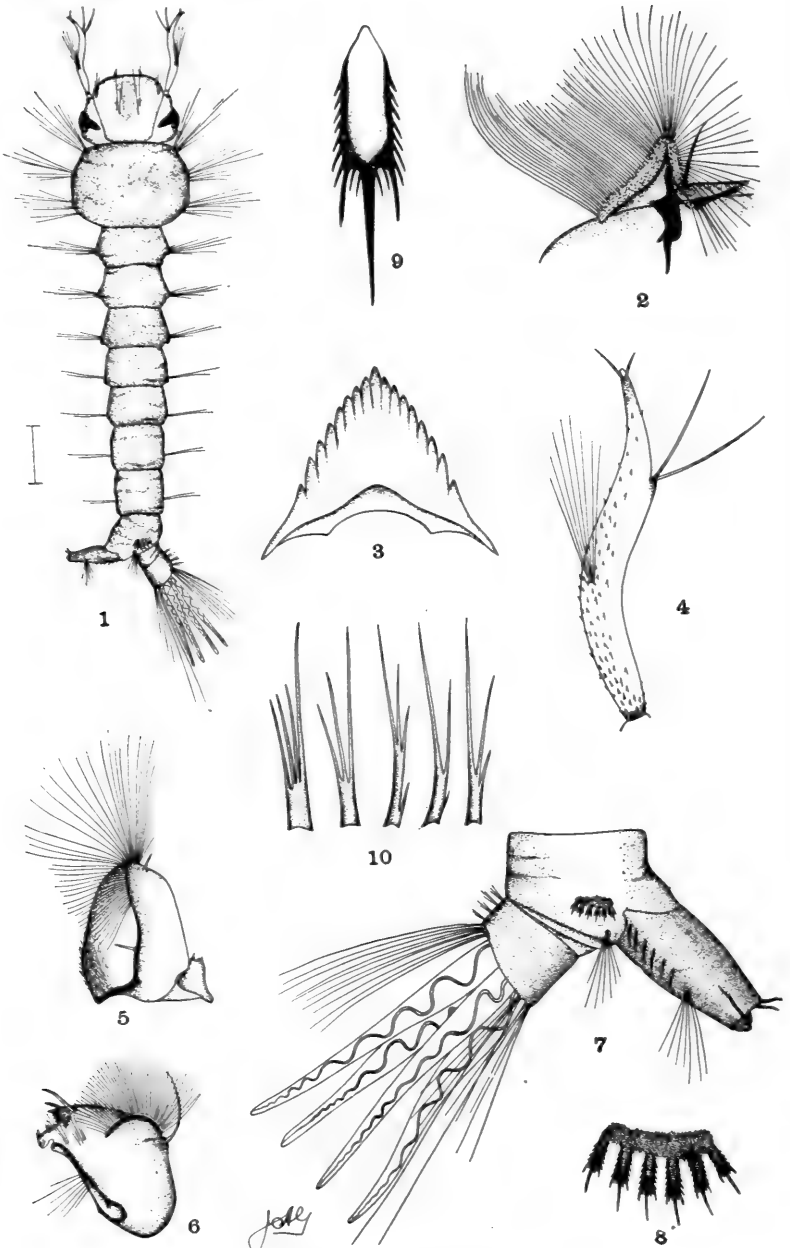


*Coq.*



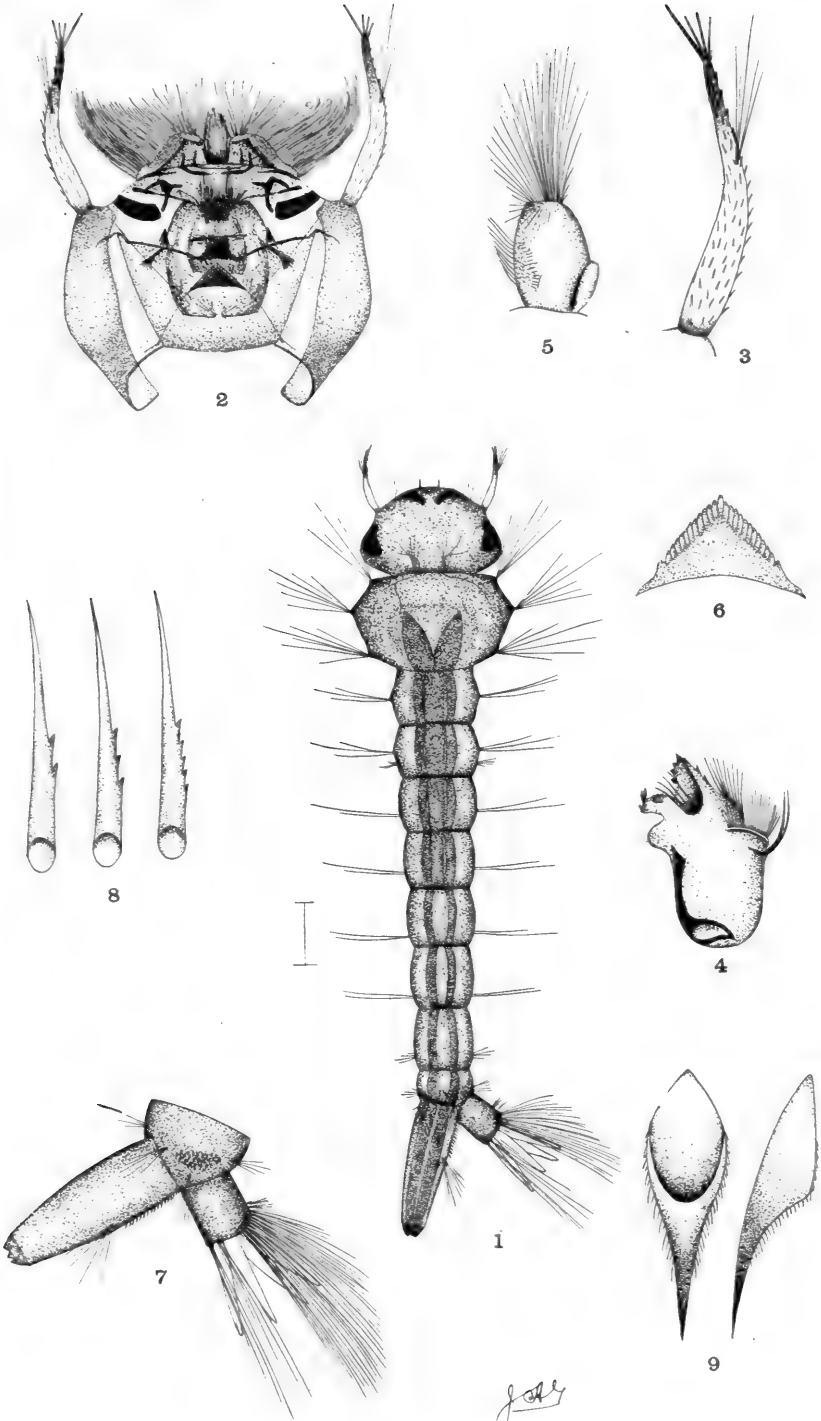
CULEX TRIVITTATUS COQ.





CULEX DISCOLOR.

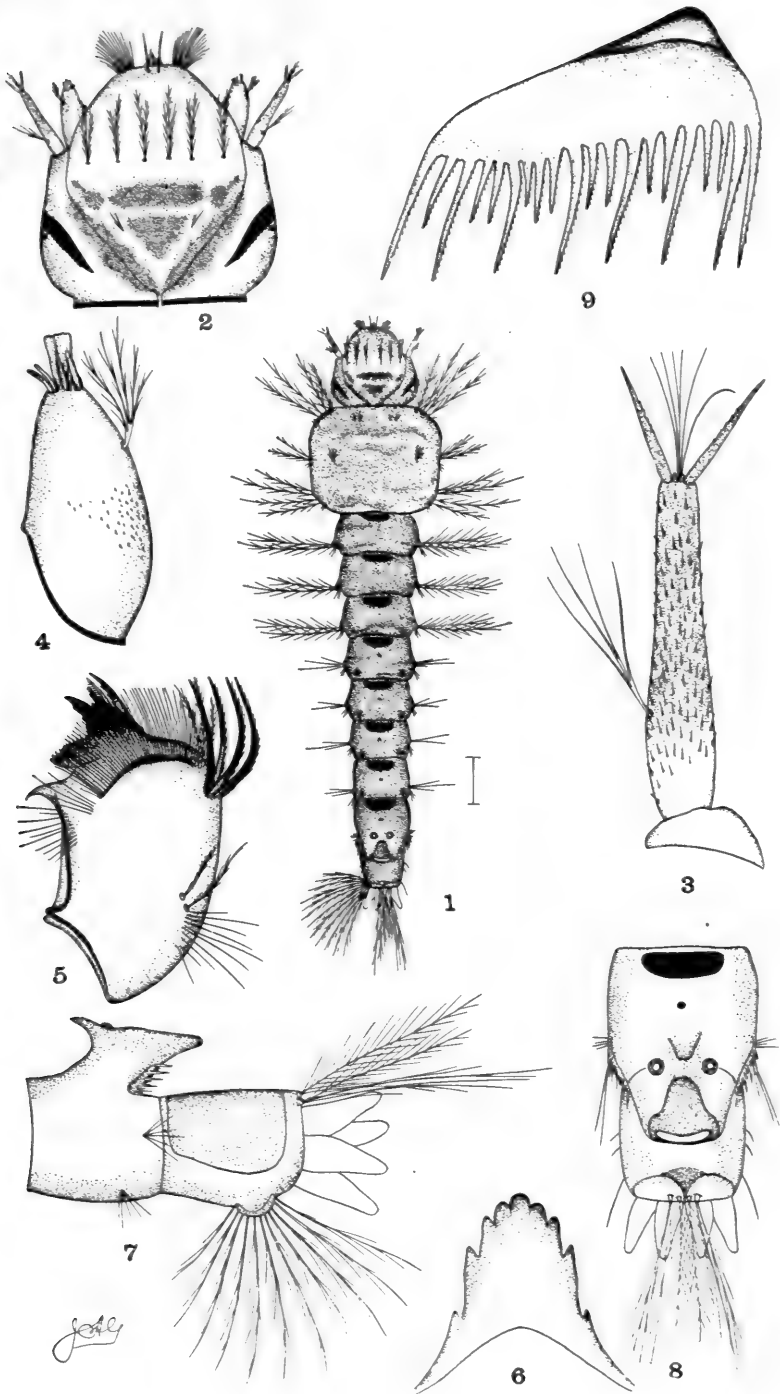




*J. S. G.*

CULEX AURIFER COQ.

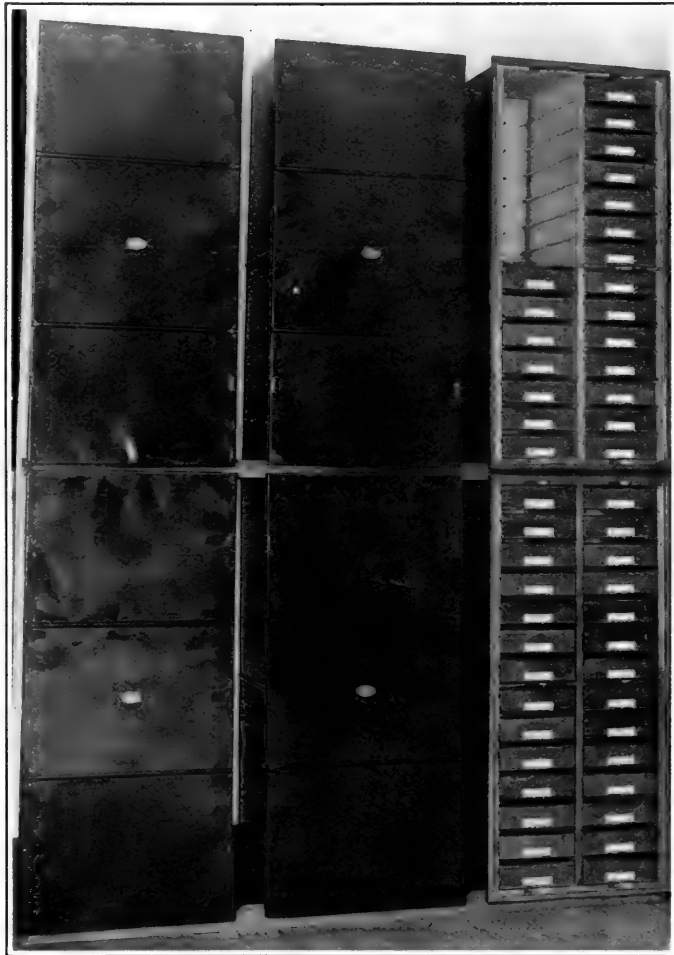




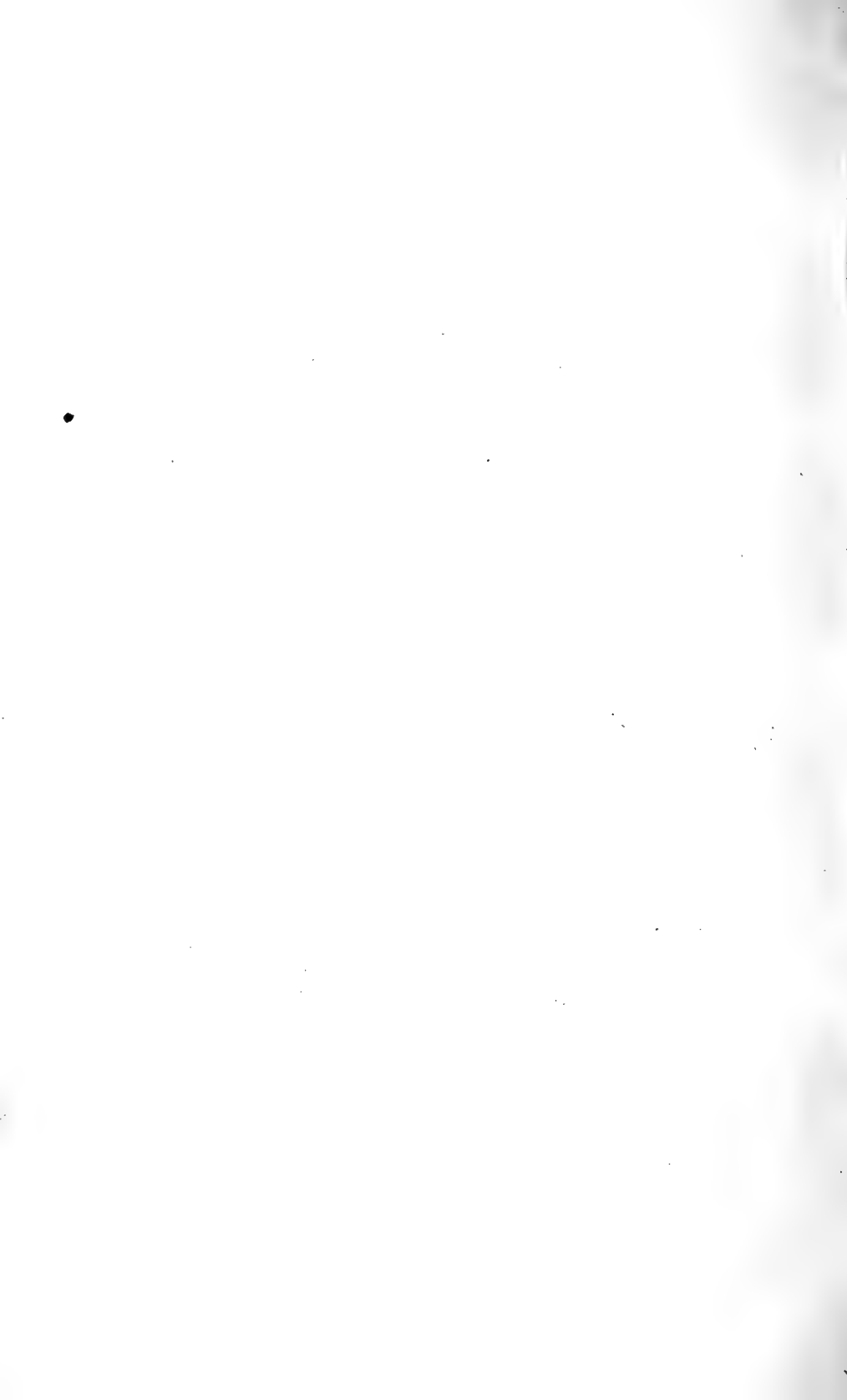
ANOPHELES CRUCIANS WIED.







NEW CASE FOR BOXES OR DRAWERS.





ROPRONIA GARMANI ASHMEAD.



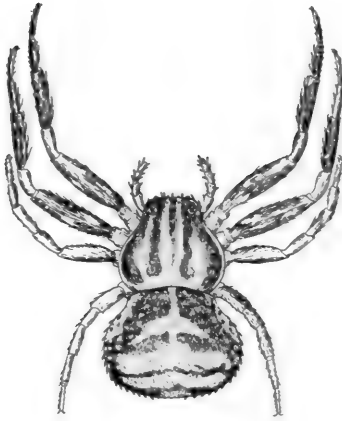


Fig. 1.

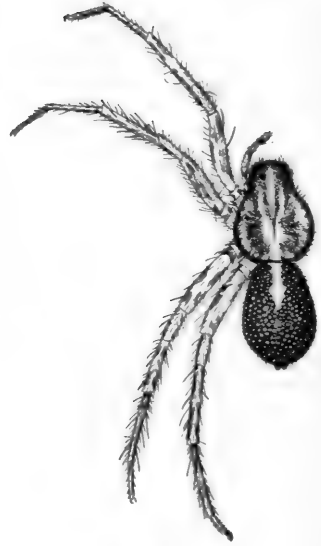


Fig. 7.

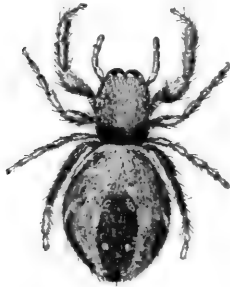


Fig. 2.



Fig. 3.

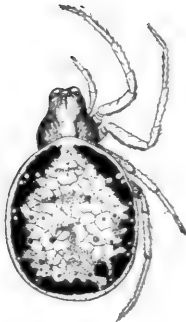


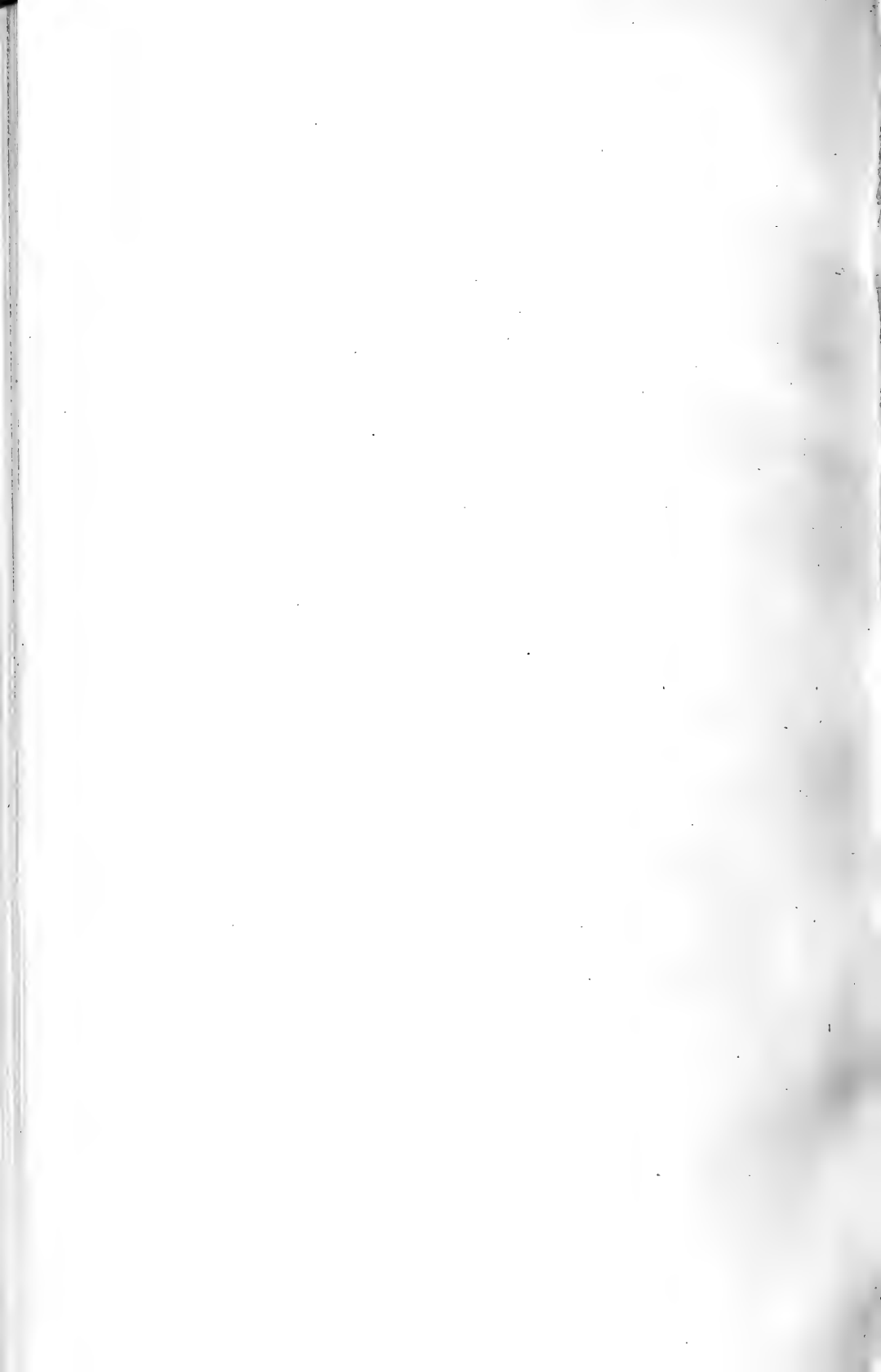
Fig. 4.



Fig. 6.



Fig. 5.



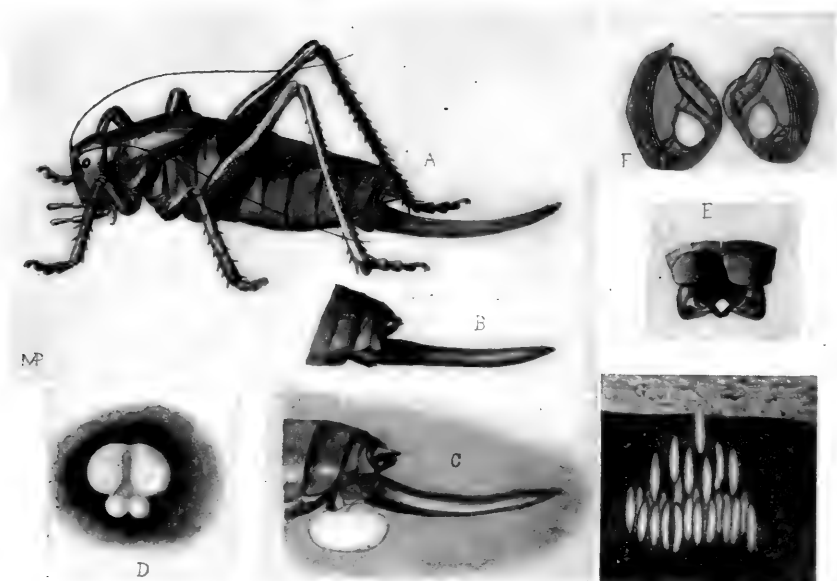


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| MR. KIRCHER    | MR. BIRSCHOFF  | A. BUCHHOLZ | G. J. KELLER | G. STORTZ     |              |                 |

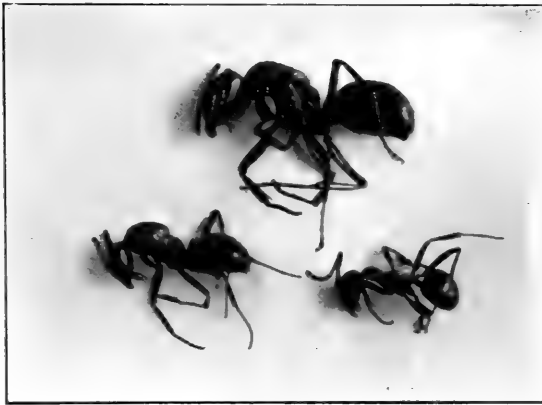






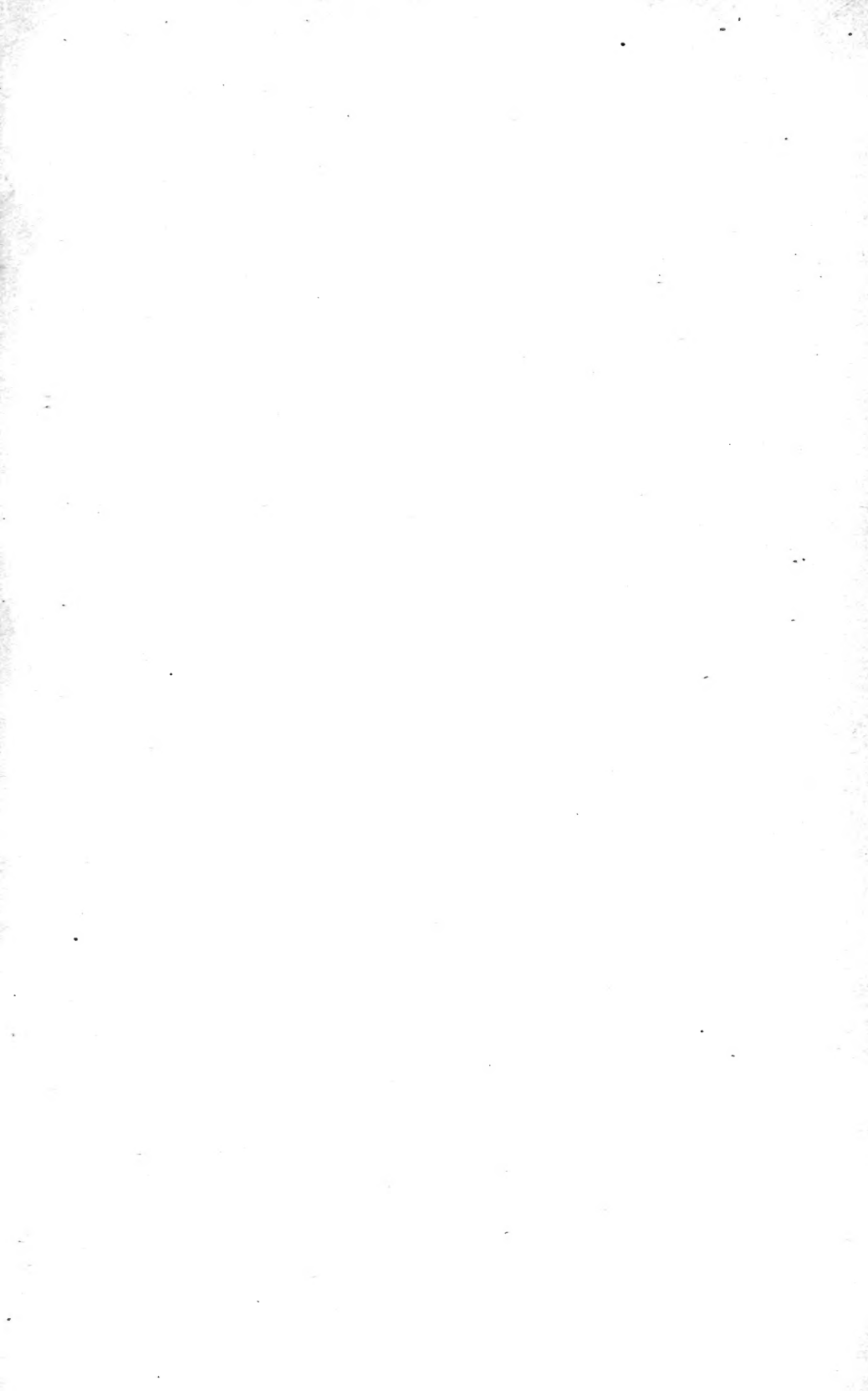
ANABRUS SIMPLEX HALD.

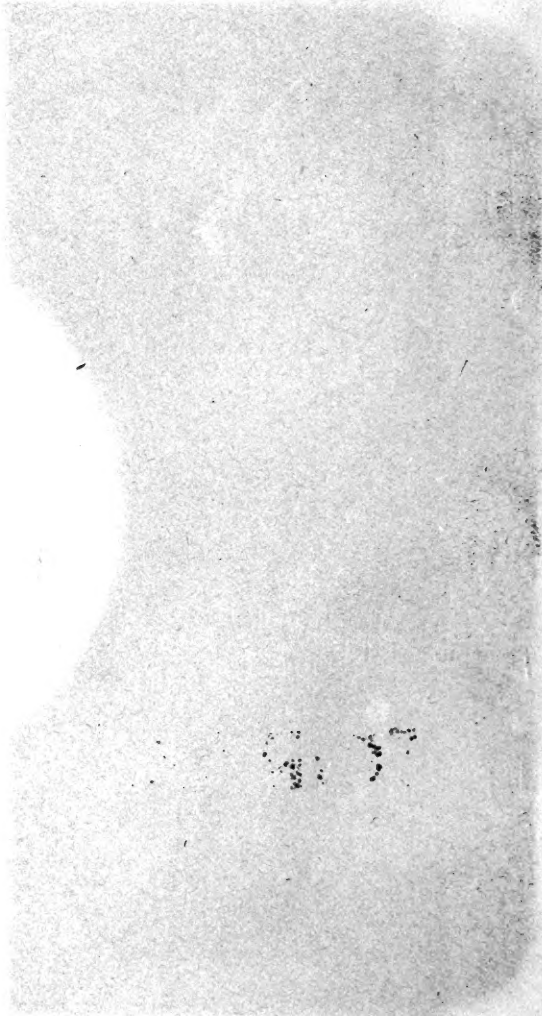




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